GARMIN

Owner's Manual

Astro™

GPS-enabled dog tracking system

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Introduction

Thank you for choosing the Garmin® Astro™ Dog Tracking System. The Astro 220 uses the proven performance of Garmin GPS and full-featured mapping to create an unsurpassed portable GPS receiver and, when combined with the DC 20, an accurate and reliable dog tracking system.

Tip and Shortcuts

- To quickly return to the Main Menu from any page, press the MENU key twice or press the BACK key repeatedly.
- To extend battery life, turn off the GPS when not using the Astro 220 for navigation or dog tracking. Also, decrease the level of the display's backlight, by quickly pressing and releasing the POWER key.
- To extend the battery life of a DC 20, turn the unit off when not tracking a dog, or decrease the update rate.

Contact Garmin

Contact Garmin if you have any questions while using your Astro 220. In the USA contact Garmin Product Support by phone: (913) 397-8200 or (800) 800-1020, or go to www.garmin.com/support/.

Table of Contents

Introduction ..... **i**
- Contact Garmin i
- Warning iv
- DC 20 Battery Warnings v
- Important Information vi
- myGarmin vi

Getting Started **1**
- Unit Overview 1
- Installing the Batteries 2
- Using the Astro 220 Keypad Functions 3
- Turning on the Astro 220 4
- Charging the DC 20 5
- Initializing the GPS Receivers 5
- Calibrating the Astro 220 Compass 6
- Operating the Astro 220 7

Dog Tracking **9**
- Communicating with the DC 20 9
- Tracking a Dog 11
- Tips for Successful Tracking 14

Main Menu **15**
- Start New Hunt 15
- Go To Marked Location 16
- View Sunrise/Sunset 16
- View Hunting Almanac 16
- Advanced 17

Mark Location **17**
- Marking Your Current Location 17
- Marking Hunting Specific Locations 18
- Marking a Location Using the Map 18
- Averaging a Marked Location 19
- Projecting a Location 19

Map Page **20**
- Map Page Options 21
- Data Fields 22
- Measuring Distance 23

Find Features **24**
- Find By Name 24
- Recent Finds 25
- Finding a Location 27
- Finding a Geocache 27
- Finding a City 28

Finding an Interstate Exit 28
Finding an Address 28
Intersections 29
Searching for a Point of Interest 29

GPS Applications 30
Trip Computer Page 30
Compass Page 31
Altimeter Page 35
Using Tracks 40
Routes 45
Navigating a Route 45
Proximity Locations 49
Satellite Page 50

Accessories 52
Calendar 52
Calculator 52
Stopwatch 53
View Sunrise/Sunset 53
View Hunting Almanac 53
Games Menu 53

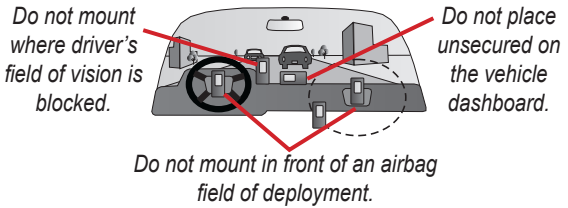
Settings 54
System Setup 54
Dog List Setup 54
Dog Alerts Setup 55
Display Setup 55
Tones Setup 55
Main Menu Setup 56
Map Page Setup 56
Routing Setup 59
Geocache Setup 60
Marine Alarms Setup 61
Time Setup 61
Units Setup 61
Heading Setup 62
Calibration Setup 62
Altimeter Setup 63

Appendix 64
Specifications 64
Optional Accessories 65
Caring for the Astro System 71
Software License Agreement 72
Product Registration 72
FCC Compliance 73
Limited Warranty 75

Warning

Failure to avoid the following potentially hazardous situations could result in an accident or collision resulting in death or serious injury.

- When installing the unit in a vehicle, place the unit securely so that it does not obstruct the driver's view of the road or interfere with vehicle operating controls, such as the steering wheel, foot pedals, or transmission levers. Do not place in front of or above any airbag. (See diagram).


Do not mount where driver's field of vision is blocked.
Do not place unsecured on the vehicle dashboard.
Do not mount in front of an airbag field of deployment.

- When navigating, carefully compare information displayed on the unit to all available navigation sources, including information from street signs, visual sightings, and maps. For safety, always resolve any discrepancies or questions before continuing navigation and defer to posted road signs.
- Always operate the vehicle in a safe manner. **Do Not become distracted by the unit while driving, and always be fully aware of all driving conditions**. Minimize the amount of time spent viewing the unit's screen while driving and use voice prompts when possible. Do not input destinations, change settings, or access any functions requiring prolonged use of the unit's controls while driving. Pull over in a safe and legal manner before attempting such operations.
- This unit is designed to provide route suggestions. It is not designed to replace the need for driver attentiveness regarding road closures or road conditions, traffic congestion, weather conditions, or other factors that may affect safety while driving.

WARNING: This product, its packaging, and its components contain chemicals known to the State of California to cause cancer, birth defects, or reproductive harm. This Notice is provided in accordance with California's Proposition 65. See www.garmin.com/prop65 for more information.

NOTICE REGARDING LEGAL RESTRICTIONS; SPECIAL NOTICE TO USERS IN CALIFORNIA AND ALASKA:
State law in California prohibits the use of GPS dog collars for the pursuit of mammals. Alaska law prohibits guides from using GPS devices to assist in the taking of big game animals. This is not intended to be an exhaustive list of applicable laws and ordinances, and Garmin makes no such guarantees or warranties that this list is complete. Check your state and local laws and ordinances to ensure you fully understand any restrictions applicable to this product in your jurisdiction prior to purchase and/or use. Garmin does not assume any responsibility for any fines, penalties, or damages that may be incurred as a result of any state or local law or ordinance relating to use of the product.

DC 20 Battery Warnings

If these guidelines are not followed, the internal lithium-ion battery may experience a shortened life span or may present a risk of damage to the DC 20, fire, chemical burn, electrolyte leak, and/or injury.

- Contact your local waste department to properly dispose of the unit/battery.
- Do not leave the unit exposed to a heat source or in a high temperature location, such as in the sun in an unattended vehicle on a hot day. To prevent damage, remove the unit from the vehicle or store it out of direct sunlight, such as in the glove box.
- Do not incinerate.
- When storing the unit for a limited length of time, store within the following temperature range: -4˚ to 140˚F (-20˚ to 40˚C). When storing the unit for an extended time, store within the following temperature range: 32˚ to 77˚F (0˚ to 25˚C).
- Do not operate the unit outside of the following temperature range: -4˚ to 140˚F (-20˚ to 60˚C).
- Recharge the unit within the following temperature range: 32˚ to 113˚F (0˚ to 45˚C).

The DC 20 unit contains a replaceable, rechargeable lithium-ion battery, the following warnings also apply:

- Do not recharge the battery outside of the unit or disassemble the battery.
- Keep the used battery away from children. Do not disassemble, puncture, or damage the battery.
- Only replace with a Garmin lithium-ion battery pack. Using another battery presents a risk of fire or explosion. To purchase a replacement battery, see your Garmin dealer or the Garmin Web site.
- Do not leave the DC 20 where a dog may attempt to chew on it. If the battery cell is punctured, electrolyte can be released that can be harmful to the dog.

Important Information

Map DATA INFORMATION: One of the goals of Garmin is to provide customers with the most complete and accurate cartography that is available to us at a reasonable cost. We use a combination of governmental and private data sources, which we identify in product literature and copyright messages displayed to the consumer. Virtually all data sources contain some inaccurate or incomplete data. In some countries, complete and accurate map information is either not available or is prohibitively expensive.

NOTICE REGARDING WINDSHIELD MOUNTING; SPECIAL NOTICE TO DRIVERS IN CALIFORNIA AND MINNESOTA: State law prohibits drivers in California and Minnesota from using suction mounts on their windshields while operating motor vehicles. Check your state and local laws and ordinances for similar restrictions. Other Garmin dashboard or friction mounting options should be used. Garmin does not take any responsibility for any fines, penalties, or damages that may be incurred as a result of disregarding this notice or as a result of any other state or local law or ordinance relating to use of the unit. (See California Vehicle Code Section 26708(a); Minnesota Statutes 2005, Section 169.71.)

The California Electronic Waste Recycling Act of 2003 requires the recycling of certain electronics. For more information on the applicability to this product, see www.erecycle.com.

myGarmin

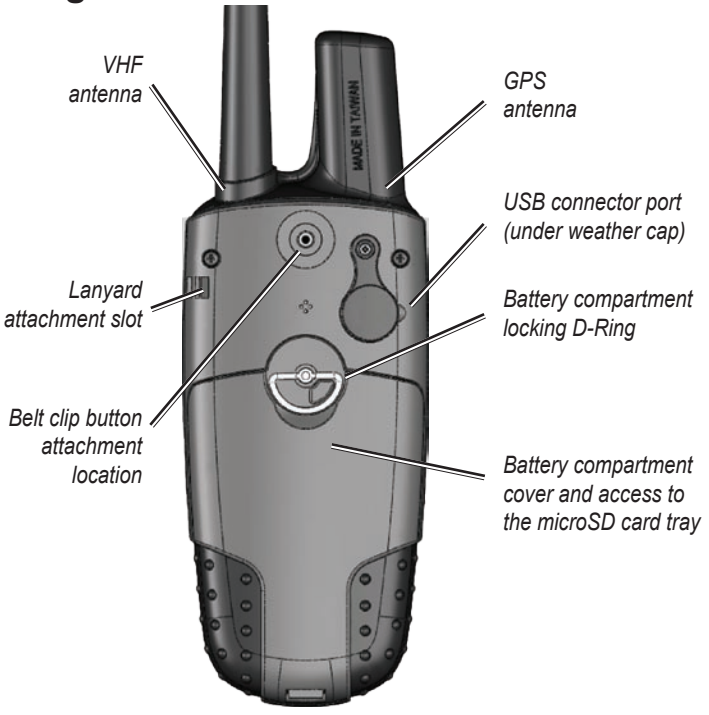
Go to http://my.garmin.com to access the latest services for your Garmin products.

From the myGarmin Web site, you can do the following:

- Register your Garmin unit.
- Subscribe to online services for Points of Interest (POIs) and other useful items.
- Unlock optional maps.
- Access MotionBased® Web-based activity tracker where you can view your saved tracks on several types of maps.
- Download geocaches to your unit.

Getting Started

Unit Overview


VHF antenna
GPS antenna
USB connector port (under weather cap)
Lanyard attachment slot
Battery compartment locking D-Ring
Belt clip button attachment location
Battery compartment cover and access to the microSD card tray
MADE IN TAIWAN

Installing the Batteries

The Astro 220 operates on two AA batteries (not included), which are located in the back of the unit. You can use Alkaline or NiMH batteries. See page 54 for information on setting the battery type.

To install the batteries:

1. Remove the battery by turning the D-Ring 1/4 turn counter-clockwise and pulling the cover loose.
2. Insert the batteries, observing the proper polarity. A polarity diagram is molded into the battery compartment.
3. Reinstall the battery cover.

Battery compartment

Remove the batteries from your Astro 220 when you do not expect to use the unit for several months. Data is not lost when batteries are removed.

To install the lanyard:

1. Place the loop of the lanyard through the slot at the upper left side on the back of the unit.
2. Route the strap through the loop and pull tight.

Refer to page 67 for information on accessing the microSD data card in the battery compartment.

Using the Astro 220 Keypad Functions

POWER Key - *Press and hold to turn the unit on or off. Press and release to adjust the backlighting.*

IN/OUT Zoom Keys - *Press to zoom in or out on the Map page. Press to scroll up or down a list on any other page.*

DOG Key - *Press and release at any time to view the Dog Tracker page.*

MARK Key - *Press and release at any time to mark a variety of locations.*

BACK Key - *Press and release to cancel data entry or move backwards through the pages to the Main Menu.*

ROCKER Key - *Press up, down, left, or right to highlight options and to enter data, or move the map panning arrow.*

Map Key - *Press and release to view the Map page.*

MENU Key - *Press and release to view page options. Press twice to view the Main Menu.*

ENT (ENTER) Key - *Press and release to enter highlighted options, select data or confirm on-screen messages.*

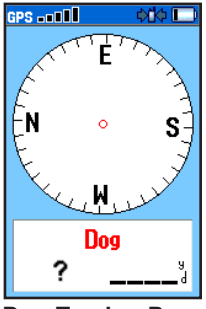
Turning on the Astro 220

The first time you turn on the Astro 220, a message appears followed by a prompt. Thereafter, when the Astro 220 is turned on, the Introduction page appears, followed by the Dog Tracker page.

To turn the Astro 220 on and off:

1. Press and hold the **POWER** key, a tone sounds and the Introduction page appears, followed by the Dog Tracker page.
2. To turn off, press and hold the **POWER** key again.

Introduction Page



Dog Tracker Page

Adjusting the Astro 220 Backlight

You may want to adjust the backlight to see the display better.

To adjust the backlight level:

1. Press and quickly release the **POWER** key.
2. Press the **POWER** key repeatedly to cycle through the brightness levels or use the **ROCKER** up/down arrows.
3. Press **ENTER** or **BACK** to close the backlight adjustment window.

Backlight Adjustment Slider

See page 55 for information on changing the display colors and backlight time out.

Charging the DC 20

Every DC 20 is partially charged before leaving the factory, so you don't need to charge before using it. However, it is recommended that you fully charge the DC 20 before using it on a hunt.

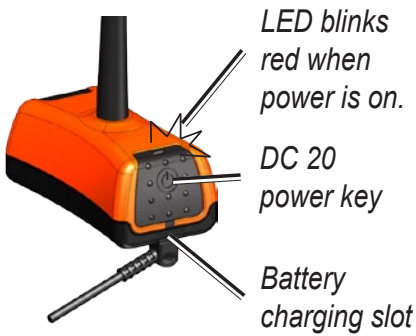
To charge the DC 20:

1. Connect the charging assembly to an appropriate electrical source.
2. Slide the slotted spade connector into the matching slot beneath the power switch.
3. Charge until the blue LED on the top of the unit turns off.

NOTE: Charging a fully depleted DC 20 battery requires 3-1/2 to 4 hours.

To turn the DC 20 on and off:

1. Press and hold the **POWER** key. When the unit turns on, the LED turns red and blinks at a steady pulse.
2. To turn off, press and hold the **POWER** key.



Initializing the GPS Receivers

The first time you turn on your Astro 220 and DC 20, each GPS receiver must collect overhead satellite signal data to establish its current location. To ensure proper initialization, the Astro 220 and DC 20 are shipped from the factory in AutoLocate® mode, which allows each receiver to "find itself" anywhere on Earth whenever you turn it on. To receive satellite signals, both units must be outdoors and have a clear view of the sky.

To initialize your Astro 220 and DC 20:

Hold the units in front of you with the antennas held upward. While the Astro 220 GPS receiver is searching for the satellite signals, observe the GPS Signal Strength bars in the Status Bar at the top of the page. When the receiver has signals from at least three satellites, the GPS bars fill to indicate signal strength and a location fix, while the LED on the DC 20 double blinks at each pulse when a location fix is achieved.

Calibrating the Astro 220 Compass

It is recommended that the Astro 220 compass be calibrated the first time you use it, after periods of storage, after you install new batteries, or when exposed to temperature changes of greater that 20°F.

Calibrate the electronic compass outdoors. The accuracy of the electronic compass is adversely affected if the unit is not held level or you are near objects that generate magnetic fields, such as cars or buildings.

To calibrate the electronic compass:

1. From the Dog Tracker page or Compass page, press **MENU** to open the options menu.
2. Select **Calibrate Compass** to open the Calibration page.
3. Select **Start** and follow on-screen directions for holding and turning the unit.
   - A “Just Right,” “Too Fast,” or “Too Slow” message appears notifying you to adjust your turning speed, as needed. Hold the unit level while turning.
   - A “Calibration Successful” message appears when finished. Press ENTER to exit.
   - If a “Calibration Failed” message appears, repeat the process.

Operating the Astro 220

This section explains how to enter and select information with the Astro 220.

Understanding Terms

The following terms are used throughout this manual:

Select—move the highlighted area on the screen up, down, left, or right with the **ROCKER** to select individual fields.

Key—when you are directed to press a key, press and quickly release the key.

Field—the location on a page where data or an option can be shown and entered. A highlighted field appears yellow.

On-screen button—use the **ROCKER** to select a button, and press **ENTER**.

Scroll bar—when viewing a list of items too long to appear on the screen, a scroll bar appears along the right side of the list. To scroll through a list, press up or down on the **ROCKER** or use the **In** and **Out** keys to scroll a set of items.

Default—the factory setting saved in the unit's memory. You can change the settings, but you can revert to the factory settings when you select **Restore Defaults** when it is an option.

Wizard—an on-screen guide to performing functions that require multiple steps and options.

Manual Conventions

In this manual, when you are instructed to select an item, small arrows (>) appear in the text. They indicate that you should highlight a series of items on the screen using the **ROCKER**, and press the **ENTER** key after each item. For example, if you see "select Dog > Show Info," you should highlight Dog, and press **ENTER**. Then highlight Show Info, and press **ENTER** again. Many features are controlled by wizards that guide you through the process with on-screen instructions and do not require detailed explanation.

To exit or return to a previous setting or page:
Press the **BACK** key to move backward through your steps. Press **BACK** repeatedly to return to the Main Menu.

Using the Status Bar

At the top of each page, the status bar provides status information for several unit features.

Status Bar

- Power to the unit is provided by either batteries or from an auxiliary source (vehicle power cable or USB cable). The Battery Power icon ( ) shows the remaining power as the battery is depleted.
- The Auxiliary Power icon ( ) appears when the unit is powered by an external source.
- Satellite signal strength bars are filled in when the unit has acquired satellites ( ).
- The Receiving Communication icon ( ) blinks whenever the unit detects an radio frequency signal on the channel it is receiving. For example, this icon blinks each time it receives a DC 20 signal.

On-Screen Messages

When a significant event in the operation of the unit occurs, an on-screen message appears to advise you of the occurrence. In each case, the condition is described and often a remedy is provided. Press ENTER to acknowledge the message and close the window.

In some instances, the message may indicate a temporary condition such as the “Calculating Route” message and closes as soon as the process is completed.

Dog Tracking

This section explains some of the more common operations you can perform with your Astro 220, including communicating with the DC 20, tracking dogs, and adding dogs to the Dog List.

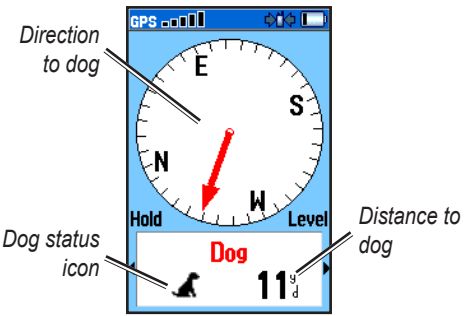
Communicating with the DC 20

After the Astro 220 and the DC 20 have been turned on and both have a GPS location fix, you can then ensure the DC 20 is communicating with the Astro 220. If you are using the DC 20 that was packaged with your Astro 220 System, it has been linked with the Astro 220 at the factory, so you can begin tracking immediately. If you are using a new DC 20, then also follow instructions for adding a new dog on page 13.

To view communication with the dog's DC 20:

Press the **DOG** key to view the Dog Tracker page with dog listed below the compass.

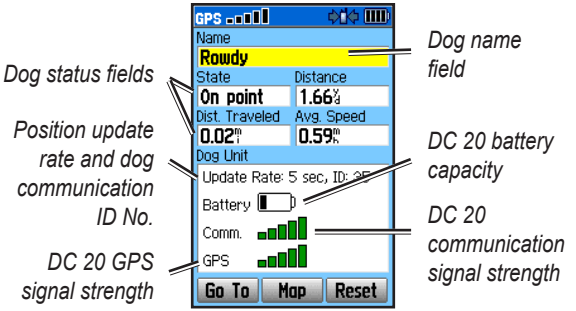
When in communication with the DC 20, this page indicates the direction of the dog, distance away from you, and status of the dog's activity. The Astro 220 can keep track of ten dogs, but only three at a time are shown on the Dog Tracker page. When additional dogs are being tracked, use the **ROCKER** to scroll through the list of dogs.



Dog Tracker Page

To view details about a selected dog unit:

Use the **ROCKER** key to select the dog on the list and then press **ENTER** to view its Dog Info page.



The dog being tracked is named at the top of the Dog Info page. The fields below the name show the dog's status (a Running, Sitting, Treed, On-Point, or Unknown?), the distance from your location, the distance traveled, and the average speed. The field titled "Dog Unit", indicates the position reporting update rate, the user assigned DC 20 ID number (0-49), the DC 20 battery capacity, the DC 20 to Astro 220 communication signal strength, and the DC 20 GPS signal strength.

Naming the dog

By default the Astro 220 assigns the name Dog (Dog 1, Dog 2, etc.) to every Dog Unit (DC 20) linked to it. When you use the **ROCKER**, to select the Name Field on the Dog Info page and press **ENTER**, an on-screen keyboard appears. Use the **ROCKER** to move about the keyboard to place your dog's name in the Name Field. Select OK and press **ENTER** when done.

Using the Go To, Map, and Reset on-screen buttons

- Selecting the **Go To** button at the bottom of the page and pressing **ENTER** takes you to the Map page with directions for navigating to your dog.
- Selecting the **Map** button takes you to the Map page to view the location and movement of your dog.
- Selecting the **Reset** button resets the dog stats and track log for that dog.

Dog Info Page Options Menu

This allows you to:

- **Stop/Start Tracking**—stops and restarts tracking the dog associated with the Dog Info page.
- **Identify Dog Unit**—rapidly blinks the DC 20's red LED for ten seconds and indicates the software version.
- **Change Comm. Settings**—allows you to assign a new ID number to a dog to avoid conflicting signals and/or the rate of reporting (5, 10, or 30 seconds).
- **Transfer Dog Unit Track**—initiates transfer of detailed tracks from the DC 20 via the Astro 220 to a computer. See page 70 for details and procedures.
- **Delete Dog Unit Track**—resets the DC 20 internal track log.
- **Change Dog Unit Type**—allows you to identify your dog type in order to show the appropriate dog status symbols. Choose from Auto, Pointing Dog, Treeing Dog, or Pet.
- **Upgrade Dog Unit**—allows free software upgrades to the DC 20 from your computer via the Astro 220. Refer to page 69 for details.

Tracking a Dog

Once you have attached the DC 20 to your dog (see the Set-up Guide for instructions on attaching the DC 20) and the dog begins to move away from you, begin tracking using the Dog Tracker page or the Map page.

Make certain that your compass is calibrated and you are holding the Astro 220 level to achieve the most accurate readings.

Tracking a dog on the Dog Tracker Page

To view the dog's direction, distance, and activity status, use the Dog Tracker page.

To view the Dog Tracker page:
Press the **DOG** key.

Observe the Dog Tracker page to see that the dog you are tracking is identified and the direction pointer is pointing in its general direction. This works best when the dog is at least thirty feet away; inside that distance a NEAR message is shown. When NEAR, the pointer is shortened.

The pointer may not point exactly at your dog as the system only sends location updates every 5 seconds. When you are close to the dog, GPS uncertainty and compass inaccuracy can contribute to several degrees of error on the dog pointer. Hold the Astro 220 level for accuracy.

Observe the dog's name, an icon showing its status, and the distance from your current location. (An unknown status symbol [?], indicates that the Astro 220 cannot determine the dog's location.) Use the pointer to locate the direction to your dog. To change the color of your dog's pointer, see page 40.

Dog status icons

Dog Tracker Page Options Menu

With the Dog Tracker page open, press the **MENU** key to open the Options Menu. This allows you to:

- **Show Info**—opens the Dog Info page for the selected dog.
- **Pause/Resume All Tracking**—pauses tracking of all dogs as you move between hunts.
- **Calibrate Compass**—allows you to calibrate the compass as explained on page 6.
- **View Dog List**—opens the Dog List to allow for adding or removing dogs.
- **Small Numbers/Big Numbers**—changes the size of the dog descriptions on the Dog Tracker page.

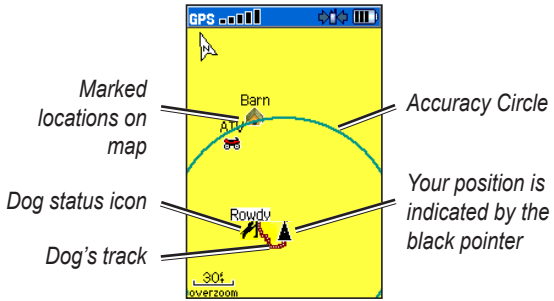
Tracking a dog on the Map Page

To view the dog's location and your own location, use the Map page.

To view the Map page:

1. Press the **MAP** key to open the Map page.

2. Observe a dog icon and the name of the dog on the map. A track showing the dog's movements is also displayed.
3. Observe your current location and track on the map.



NOTE: When the Map page is in the Track Up orientation mode, objects on the map appear to rotate around your position. Actually, as you move, the entire map reorients in the direction you are facing. To make the objects remain stable, set the orientation to North Up by following instructions for general map set-up on page 56.

To learn more about the Map page features and custom settings, refer to page 56.

Adding dogs to the Dog List

If you purchased your Astro 220 as a kit, the DC 20 provided in the kit was linked to the Astro 220 at the factory. If you have additional DC 20 units, you can link them to the Astro 220 using the setup wizard in the Dog List.

To add a new dog to the list:

1. With the Dog Tracker page open, press **MENU** > **Dog List** > **<Add New>**. Press **ENTER** to open the setup wizard.
2. Follow the setup wizard instructions using the **ROCKER** and **ENTER** keys to select and confirm options. By default, the new dog is named Dog and an ID number is randomly assigned.

NOTE: The setup wizard may indicate that there is a conflict with the ID number of another dog. To resolve the conflict, follow the setup wizard instructions and as indicated in the following section.

Conflicting dog signals

Each dog you are tracking has its own ID number. If two dogs within range of the Astro 220 have the same ID the Astro 220 warns you of a conflicting ID signal. It then opens a setup wizard to guide you through the process of ignoring the conflict. If necessary, you can assign new ID numbers to each dog. Also, because you can track 10 dogs at once, certain IDs cannot be used together. For, example: 12, 22, 32, and 42 cannot be used together. Allow the Astro 220 to automatically assign IDs, unless you are an advanced user.

To assign a new ID number to a dog:

1. With the Dog Info page open, press **MENU** > select **Change Comm. Settings**.
2. Follow the on-screen instructions.
3. Select an unassigned and non-conflicting ID > **OK**.
4. Change the update rate, if desired. Both 10 and 30 second updates reduce battery drain, but create a less detailed dog track and collected statistics. (See page 70 for downloading.)
5. Follow the on-screen instructions to finish the setup wizard.

NOTE: You must be able to touch the Astro 220 to the DC 20 to change the ID.

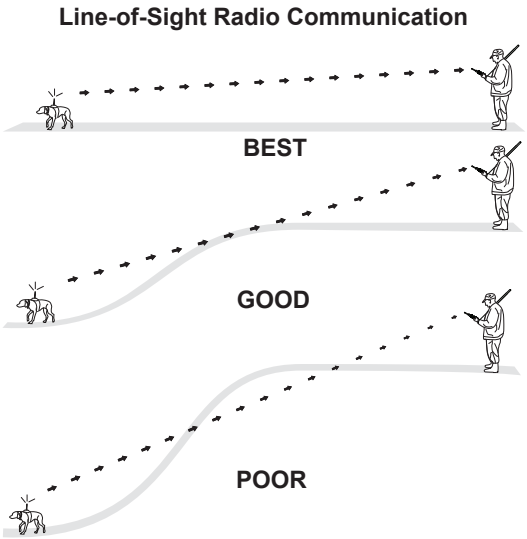
Tips for Successful Tracking

Use a fully charged DC 20

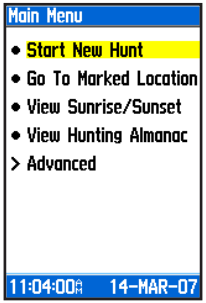
Observe the Dog Info page to determine the battery capacity of the DC 20. A fully charged DC 20 operates for approximately 17 hours with 5 second interval reporting.

Use line-of-sight radio communication

The Astro 220 and DC 20 use radio signals to communicate with each other. Objects in the path of radio signals degrade the quality of signal that reaches your Astro 220. Keeping an unobstructed “line-of-sight” between you and your dog’s DC 20 produces the best communication signal. Partially or fully obstructed radio waves result in a poor signal.



Main Menu



To open the Main Menu press MENU twice.

Start New Hunt

This option provides the ability to easily reset dog statistics, track logs, and mark the location of your vehicle.

To clear the statistics from a previous hunt and mark a new starting location:

Select **Start New Hunt** and follow on-screen instructions.

Go To Marked Location

To navigate to a location you have marked:

Select **Go To Marked Location** > select the location you want from the list.

View Sunrise/Sunset

The View Sunrise/Sunset page shows sunrise, sunset, moonrise, and moonset times before beginning a hunt.

To view sun and moon locations for a specified time, date, and location:

1. Select **View Sunrise/Sunset**.
2. To view the predictions for a different date and time, select either the **Date** or **Time** field to open the on-screen keypad.
3. To view the predictions for a different location, select the **Location** field to open the New Location Options Menu.

View Hunting Almanac

An almanac of tables provides you with a listing of predicted best times for hunting and fishing for a chosen date and location.

To show hunting and fishing predictions for a specified date and location:

1. Select **View Hunting Almanac**. The current date and location appear in the date and location fields at the top of the page.
2. To view the predictions for a different date, select **Date** to open the on-screen keypad.
3. To view the predictions for a location, select the **Location** field to open the New Location Options Menu.
4. Choose **Use Map** to select a point on the map using the pointer arrow. Press **ENTER** to show the table for that location.

Advanced

Select **Advanced** to view the following advanced feature menus:

Find—used for locating and navigating to marked locations and other items contained in the Astro 220 basemap and on downloaded MapSource® detailed maps.

GPS Applications—navigation tools used to aid navigation and provide information about your progress.

Accessories—convenient tools such as a calendar and calculator.

Settings—allows you to customize Astro 220 features to your requirements.

Mark Location

Locations are landmarks you record and store in your Astro 220. When beginning a hunt, it's a good practice to mark the location of your vehicle so you can use your Astro 220 to navigate back to it. The Start New Hunt option does this automatically, or you can press the **MARK** key.

Marking Your Current Location

Use the **MARK** key to quickly mark new locations. You must have a valid GPS position fix to mark your current location.

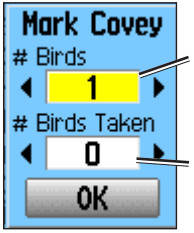
To mark your current location:

1. Press **MARK**. The Mark Location window appears with the "New" option highlighted.
2. Press **ENTER** to view the Mark Location page.
3. To accept the location as a marked location, select **OK**.

Marking Hunting Specific Locations

When you press the **MARK** key, the Mark Location Menu appears with the New option highlighted. All of the items shown mark your current location, and some assign a special hunting related name and symbol to the marked location. Choose from Covey, Truck, ATV, Lodge, Camp, Blind, or Tree Stand. The Mark Covey option opens a window for entering data about a bird covey location for later review. You can enter the estimated number of birds flushed and the number taken and then select **OK** to mark that location.

When you mark this location the date and time plus bird information is recorded to aid in finding this covey site again, and to aid in managing bird numbers.



Enter the number of birds flushed

Enter the number of birds taken

Marking a Location Using the Map

You can quickly create a location using the Map page, when you use the **ROCKER** key to pan the map and move the arrow to a map item.

To mark a location using the Map page:

1. Press **MAP**, and use the **ROCKER** to move the pointer to the map item you want to mark as a location.
2. Press **ENTER** to capture the pointer location and open the information page for the map item.
3. Select **Save**. If the map item selected contains no information, a “No map information at this point. Do you want to mark a location here?” message appears. Select **Yes**.
4. To change any information on the Location page, select the appropriate field, and press **ENTER** to open the on-screen keypad. After entering and confirming your changes, select **OK**.

Editing a Location

You can edit a location by changing the symbol, name, note, location coordinates, elevation, and depth.

To edit a location:

1. Select **Advanced** > **Find** > **Marked Locations** to open the Location page.
2. Select the location you want to edit, and press **ENTER**.
3. Make changes by selecting each field and use the location symbol chart and alphanumeric keypad to enter new data.

To move a location on the Map page:

1. Select **Advanced** > **Find** > **Marked Locations**.
2. Select **Map** to show the location on the map.
3. Press **ENTER** again to place a **MOVE** marker next to the location.
4. Use the **ROCKER** to move the location to a new location on the map, and press **ENTER**.

Averaging a Marked Location

You can average a marked location for more accuracy.

To calculate the average location:

1. When at a location that you want to calculate an average for, and press **MARK** > **Avg** to open the Average Location page to begin averaging.
2. Press **Save** when done.

Projecting a Location

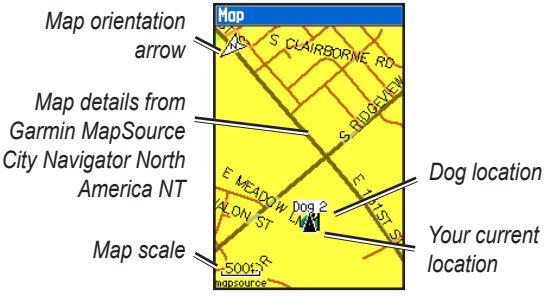
You can create a new location by projecting the distance and bearing from a marked location to a new location.

To project a location:

1. Select **Advanced** > **Find** > **Marked Locations**. Select the location and press **ENTER**.
2. Press **MENU** > select **Project Location**.
3. Enter the bearing and distance to the projected location in the appropriate fields at the bottom of the page then to navigate to it, select **Go To**.

Map Page

The Astro 220 comes with a built-in basemap that includes cities, interstates, state, and county highways, exit information, and lake and river outlines. The standard basemap can be enhanced using MapSource detailed mapping data as shown below.



There are two map operating modes. Position mode pans the map to keep your present location in the display area. The position marker shows your travel on the Map page.

When you press the **ROCKER**, the Astro 220 enters pan mode, which moves the map to keep the map pointer within the display area. You can move the map pointer about the page to highlight and identify map items.

You can change the map scale to zoom in or out on items shown on the page by using the **IN** and **OUT** keys. When zoomed in, the map page shows an accuracy circle representing the area containing your current location.

You can add and configure up to four optional data fields to the top of the page to provide a variety of travel and navigational information. You can view the detailed mapping data loaded on an optional microSD card.

To review map information:

1. On the Map page, press **MENU** > select **Setup Map**.
2. Use the right or left **ROCKER** to select the Map Setup Info page. The list of maps stored in the unit microSD card appears. A check mark indicates the map is shown on the Map page.

Map Page Options

Use the Map page Options Menu to customize the Map page. With the Map page open, press **MENU** > select an option > press **ENTER**.

The following options are available:

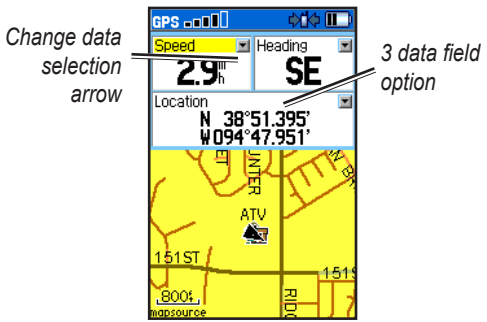
- **Stop (Resume) Navigation**—stops navigation and is disabled when there is no active navigation.
- **Recalculate**—recalculates an auto route and is disabled when there is no active navigation.
- **Data Fields**—opens the Show sub-menu so you can select the number of data fields to show at the top of the Map page: Map Only, 1 wide, 2 small, 3 (2 small and 1 wide), or 4 data fields.
- **Change Data Fields**—allows you to select the type of data you want to show in the data fields. Available only if the data fields option is being used.
- **Guidance Text**—shows messages advising you of your next move when navigating to a destination.
- **Setup Map**—opens six pages of map display settings so you can customize the map to your preferences.
- **Measure Distance (Stop Measuring)**—measures the distance from your location to the map pointer.
- **Turn Declutter On (Off)**—eliminates the display of items on the map that can block road details when the map is zoomed out.
- **Restore Defaults**—returns the map display to the factory set defaults.

Data Fields

When navigating on the Map page, you can add and configure data fields at the top of the page that provide a variety of travel and navigational information.

To show data fields on the Map page:

1. Press **MENU** > select **Data Fields**.
2. Select the data field configuration you want and press **ENTER**.

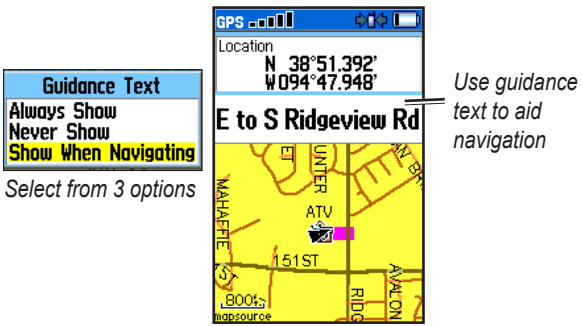


To change the data shown in selected fields:

1. Press **MENU** > select **Change Data Fields**.
2. Observe a selection arrow in the corner of each data field on the Map page.
3. Select the field you want to change and press **ENTER** to show a list of options.
4. Select an option and press **ENTER**.

Guidance Text

When navigating a route, guidance text appears above the map. Guidance text shows useful information when navigating to a destination.

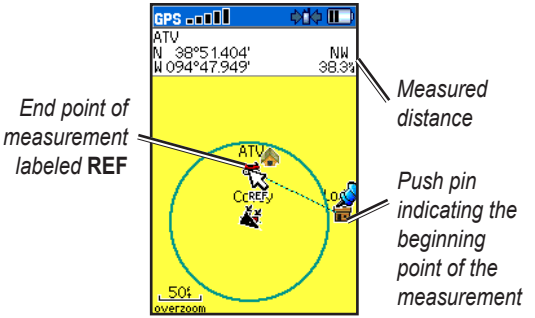


Measuring Distance

You can measure the distance between two map items.

To measure distance between two points:

1. Press **MENU** > **Measure Distance**. An on-screen arrow appears on the map at your current location with **REF** below it.
2. Move the arrow to the point you want to measure from and press **ENTER**. A push pin marks the point.
3. Move the arrow to the point you want to measure to. The distance between the two points is shown in the upper-right corner of the Map page.



Find Features

Use the Find Menu to search for marked locations, cities, and exits included in the Astro 220 basemap. Additional categories appear depending on the optional MapSource compatible detailed maps or BlueChart data loaded in the unit. When you open a Find category, it contains only those items near your current location or the pointer (if active).

The options menu for each category contains a submenu of search options: Find By Name, Find Nearest (near your current location), Select Symbol (for location), Change Reference (by moving the pointer to a new location), Nearest Containing (a keyword you enter), and Select Category (for those groups, such as Food or Lodging). Use these options to shorten your search.

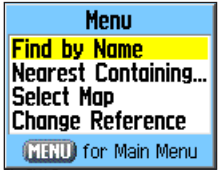
To open the Find Menu:
Press **MENU** twice > select **Advanced** > **Find**.

Find By Name

If you know the name of the location you want to find, use the Find By Name option.

To find a location using Find By Name:

1. Press **MENU** twice > select **Advanced** > **Find**.
2. Use the **ROCKER** to select the type of item you want to find, and press **ENTER**.
3. Press **MENU** > select **Find By Name**.
4. Use the on-screen keypad and enter the name of the location you want to find. When the Find list contains a match, highlight **OK**.
5. Select the item in the Find list, and press **ENTER**. The information page opens, allowing you to save the item as a location, show the item on the map, or automatically create a route to the item (Go To).



Find options menu

Recent Finds

The Recent Finds page contains a list of the last 50 items you have viewed while searching.

To go to a recently found item:

1. Press **MENU** twice > select **Advanced** > **Find** > **Recent Finds** > to open the Recent Finds page.
2. Select the item you want to go to, and press **ENTER** to open the item's information page.
3. Select **Go To**.

Find Item Information Page Options Menu

The options menu for each information page contains options for using a Find item as a tool for navigation.

To use the Options Menu:

1. With an information page open for a Find item, press **MENU**.
2. Select an option > **ENTER**:

- **Average Location**—average a marked location for a more accurate reference (see page 19).
- **Project Location**—create a new location by referencing a known location by entering bearing and distance from that location (see page 19).
- **Find Near Here**—returns to the Find Menu where you can search for map items near the item defined on the information page (see page 24).
- **Change Reference**—point to a new location on the Map page using the pointer (see page 19)
- **Set Proximity**—program an alarm to sound when you are within a specified radius of an item defined by the information page (see page 49).
- **Add To Route**—include this item on a new route or add it to an existing route (see page 45).
- **View Sunrise/Sunset**—view Sunrise/Sunset tables for this item location (see page 16).
- **View Hunting Almanac**—view Hunting tables for this item location (see page 16).
- **Map Information**—show the detailed map from which the map item originated.

To find an item near another item:

1. Press **MENU** twice > select **Advanced** > **Find**.
2. Select a category on the Find List, and press **ENTER**.
3. Select an item in the list, and press **ENTER** to open the information page.
4. Press **MENU** > select **Find Near Here**. The Find Menu opens again with each category containing items near the item selected on the information page.
5. Select a category and press **ENTER** to open a Find list of items near the item.

To find an item from another location on the map:

1. Press **MENU** twice > select **Advanced** > **Find**.
2. Select a location on the Find Menu, and press **ENTER**.
3. Press **MENU** > select **Change Reference**. The Map page appears.
4. Use the **ROCKER** to pan the arrow (pointer) to the map location you want, and press **ENTER** to show a list of items near the new map location.

Finding a Location

The Marked Location page contains a list of all saved locations. Locations are stored in alphanumeric order and are also identified by a symbol assigned from a list of symbol types.

To find a location:

1. Press **MENU** twice > select **Advanced** > **Find**.
2. Select **Marked Locations** to open the Location page.
3. Select a location, and press **ENTER**.

Finding a Geocache

You can view the list of geocache locations created using your Astro 220 or downloaded from your computer.

For more information about geocaching, go to my.garmin.com, login and click "Go Geocaching".

To find a geocache:

1. Press **MENU** twice > select **Advanced** > **Find**.
2. Select **Geocache** to open the Geocache page. You can view either found geocaches or those that have not been found.
3. Select a geocache, and press **ENTER** to open the information page.
4. Select **Go To** to navigate to the geocache location.

When a geocache is found, the unit marks the cache as found, logs an entry into the calendar, and provides an option that, when activated, shows the nearest cache.

Finding a City

Select **Cities** on the Find Menu to find any city listed in the mapping database.

To find a city:

1. Open the Find Menu.
2. Select **Cities.** The Cities page shows a list of cities near your current location.
3. Select a city from the list and press **ENTER** to open the information page for the selected city.

   OR

   If the city you want is not listed, press **MENU** > select a search method > **ENTER**.

Finding an Interstate Exit

Use Exits on the Find Menu to find an interstate exit.

To find an interstate exit:

1. Open the Find Menu.
2. Select **Exits** > **ENTER**. The Exits page shows a list of interstate exits near your location.
3. Select an exit > **ENTER** to open the information page. This page contains the exit description, a list of available services near the exit, and the distance and bearing from the exit to the highlighted service.
4. Select a service from the list > **ENTER** to open the information page for the selected service.

Finding an Address

If you downloaded detailed mapping data, use Addresses on the Find Menu to find an address. When you enter the street number, street name, and city, the find feature matches that data with addresses in the map database.

To find an address:

1. Open the Find Menu.
2. Select **Addresses** to open the Addresses Search page.

   If your unit has a GPS fix, the **<ENTER Region>** field is populated with your current region. You do not have to specify a city in the **<ENTER City> field** because the database has information for the entire region.
3. Select <**ENTER Number**> > **ENTER**.

4. Enter the street number using the on-screen keypad. When finished, select **OK**.
5. Select **<ENTER Street Name>** >**ENTER** to open the street list.
6. Use the on-screen keypad to enter enough of the street name to show a match. When finished, select **OK**.
7. Select the best address match > **ENTER** to open the Address information page.

Intersections

This feature also requires detailed mapping data. Follow the basic steps for finding an address when searching for an intersection.

Searching for a Point of Interest

If you downloaded MapSource detailed mapping, you can use the **All Points of Interest** category on the Find Menu to locate a nearby restaurant, lodging, landmark, public building, or select a category from the Find Menu.

To find a point of interest:

1. Open the Find Menu.
2. Select **All Points of Interest** to show a list of all points near your current location.
3. Press **MENU** to open the Options Menu where you can select options to narrow your search.
4. Select the item you want from the list, and press **ENTER** to open the information page for the selected item.

POI Loader and Custom Points of Interest

You can create your own category for points of interest by using the Garmin POI Loader utility, downloadable from the Garmin Web site: www.garmin.com/poiloader/. Follow the Help instructions to use POI Loader.

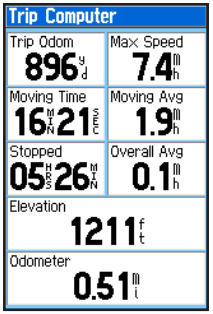
GPS Applications

The Main Menu Advanced option contains the GPS Applications Menu. The Main Menu can be accessed by pressing the **MENU** key twice. Each GPS Application has an options menu, containing setup options and functions that apply to the application. To view the options menu for an application, press **MENU**.

Trip Computer Page

The Trip Computer page provides you with a wide variety of travel data that can be useful when navigating a long distance. It indicates your current speed, average speed, trip odometer, and many other helpful statistics useful for navigation.

You can customize the trip computer screen to meet your personal requirements by pressing **MENU** and selecting **Change Data Fields**.



Trip Computer Page Options Menu

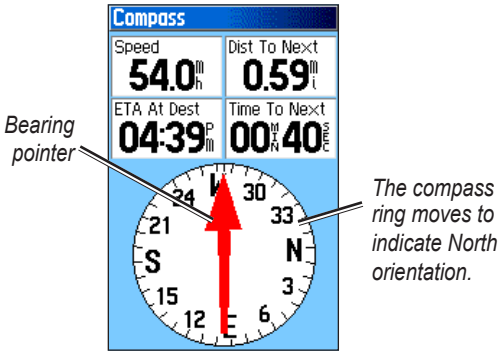
The following options are available:

- **Reset**—clears saved trip statistics.
- **Big Numbers**—shows fewer data fields with larger numbers.
- **Change Data Fields**—allows you to change the type of data shown on the Trip Computer.
- **Restore Defaults**—returns the data fields to factory settings.

Compass Page

During active navigation, the Compass page guides you to your destination with a graphic compass display and a bearing or course pointer.

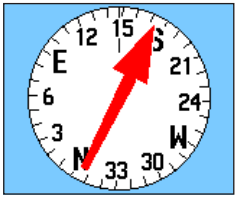
It also provides navigation data such as current speed, distance to the next point on the route, and estimated arrival time.



Compass Page

To learn how to use the bearing and course pointers refer to page 34.

Course Pointer



Bearing Pointer

Hold the compass level when navigating to ensure maximum accuracy.

Compass Page Options

Use the options menu to customize the Compass page. With the Compass page open, press **MENU**. To select an option, highlight it, and press **ENTER**.

The following options are available:

- **Sight 'N Go**—allows you to navigate to an object within your sight by pointing the unit at it.
- **Stop or Resume Navigation**—turns active navigation for a route or a Go To on or off.
- **Recalculate**—recalculates the path to a destination.
- **Course or Bearing Pointer**—auto routes between the course pointer and the bearing pointer.
- **Data Fields**—allows you to select from 2, 3 or 4 data fields that appear on the Compass page.
- **Change Data Fields**—allows you to select the type of data you want to show in the data fields.
- **Calibrate Compass**—accesses the Compass Calibration page for calibrating the compass.
- **Restore Defaults**—returns to the factory settings.

Sight 'N Go Navigation

Sight 'N Go allows you to set a course to a point you can see in the distance.

To use Sight 'N Go to navigate:

1. Press **MENU** > select **Sight 'N Go** > to start the Sight 'N Go feature. The compass ring with pointer is in line with the two sighting marks on the case (the top arrow of the **ROCKER** and tic mark at the top of display bezel).
2. Hold the unit at eye level and line up the two sighting marks with the distant object.
3. Press **ENTER** to lock the direction and open the Sighting page.

Sighting Page

4. Select **Set Course** to open the Compass page.
5. Begin traveling to your destination on a course line using the course pointer as a guide.

   OR

   Select **Project Location** to open the Project Location page.
6. Enter an estimated distance from your current location to establish a projected location.
7. Select **Go To** to open the Map page and begin navigation to the projected location. The Compass page shows a bearing pointer for guidance.

Stop/Resume Navigation

To stop navigation:

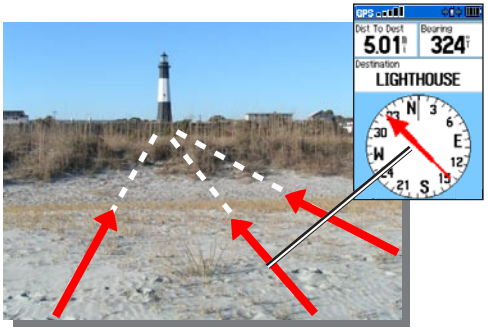
Press **MENU** > select **Stop Navigation**.

Using the Course or Bearing Pointer

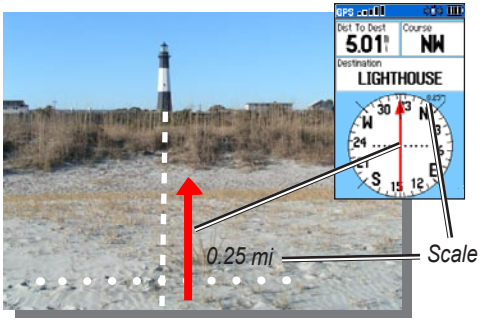
The bearing pointer and course pointer work independently of each other. The bearing pointer indicates the direction to your destination, and the course pointer indicates your relationship to a course line leading to the destination.

If the bearing pointer arrow is pointing straight ahead of you, you are traveling directly toward your destination. If it points any direction other than ahead, turn toward that direction until the arrow is pointing ahead and then continue in that direction. The bearing pointer points to the destination, regardless of the direction you are moving. The bearing pointer is most useful if you must move around obstacles (lakes, private property, etc.) in your path.

If you are using the course pointer option, and you drift away from the line of travel from your original location to your destination, the course deviation indicator (an arrow with horizontal dotted line) provides graphic indication of drift (right or left) according to the scale shown at the edge of the compass ring.



The bearing pointer always indicates the direction to your destination from your current location.



The course pointer indicates your course of travel from your original location and the distance off course.

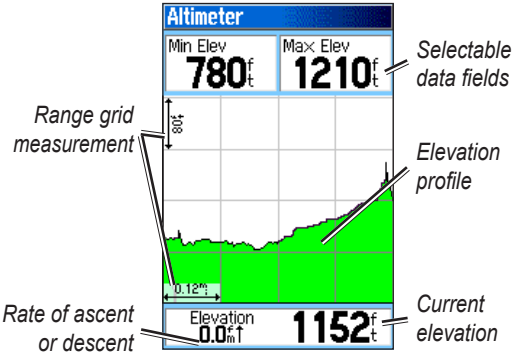
Move to the center line to get back on course. This is most efficient if you are navigating on water or where there are no major obstacles in your path. It also helps you avoid hazards to either side of the course, such as shoals or submerged rocks.

Altimeter Page

The Altimeter page can show you the current elevation, the rate of your ascent or descent, a profile of elevation changes over distance or time, or a profile of pressure changes over time.

To open the Altimeter page:

Press **MENU** twice > select **Advanced** > **GPS Applications** > **Altimeter**.



Altimeter Page

The Status field at the bottom of the page shows the current elevation and your current rate of ascent or descent when moving. It can also show the ambient pressure and time of measurement.

You can configure the profile field in the center of the page to show either elevation or ambient pressure plots as selected from the Altimeter page Options Menu.

Data fields at the top of the page are user selectable and show a variety of recorded or current data.

Altimeter Page Options

Use the Altimeter page Options Menu to customize the Altimeter page. With the Altimeter page open, press **MENU** to open the Options Menu.

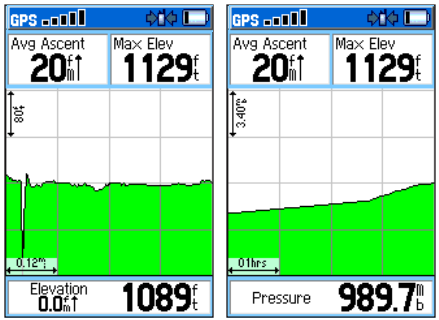
- **Plot Over Time or Plot Over Distance**—plots the elevation over a period of time or plots the elevation over a distance.
- **View Elevation Plot (View Pressure Plot)**—shows the elevation or the pressure plot.
- **Zoom Ranges**—allows you to select Zoom Ranges for elevation, distance, or time when you show the View Elevation Plot over distance or time.
- **Reset**—allows you to reset the elevation data and the maximum elevation data.
- **Calibrate Altimeter**—If you know the correct elevation for your location, you can increase the accuracy of the altimeter using the "Calibrate Altimeter" option.
- **Restore Defaults**—clears recorded data from the page and begins recording new data.

Customize the View option displays using the Zoom Ranges option to determine time, distance, pressure, and elevation parameters.

Plot Over Time or Distance

These two measurement options (changes over a set period of time or changes over a set distance) apply only to the View Elevation Plot option. The View Pressure Plot option is measured by time and pressure only. When one

option is active, the other is shown on the Altimeter page Options menu.



Elevation over Distance plot **Pressure over Time plot**

View Pressure or Elevation Plots

Select the **View Elevation Plot** option to plot a profile of elevation changes that occur as you navigate over a set distance or period of time. Select **View Pressure Plot** to view a record of changes in barometric pressure for a set period of time.

To view elevation or pressure plots:

1. Select the option you want from the Altimeter Options menu, and press **ENTER** to show the plot.
2. Adjust the time and distance measurement using the Zoom Ranges option explained on the pages that follow.
3. To clear the plot and start again, you must clear the Track Log.

Zoom Ranges

You can set the zoom ranges for elevation, distance, or time when you show the View Elevation Plot.

- Ranges for vertical distance are shown as you press up or down on the **ROCKER**.
- Ranges for linear distance are shown as you press left or right on the **ROCKER**.
- Ranges for time are shown for a time plot when you press left or right on the **ROCKER**.

Ranges for View Pressure Plot pressure values are shown when you press up or down on the **ROCKER**. Values for time are shown in the same manner as for elevation plots.

To adjust zoom ranges:

1. Select the type of plot you want to view, and use the **ROCKER** to select **Zoom Ranges** on the Options Menu.
2. Press **ENTER** to open the Zoom Ranges page. Press up or down on the **ROCKER** to adjust the vertical distance or pressure, and press left or right to adjust either the time or distance.

   OR

   Press up or down on the **ROCKER** while a plot is displayed to switch to the Zoom Range mode.
3. Press **ENTER** to return to the Plot page.

View Points

You can scroll through a recorded elevation or pressure profile to view data for any point along the profile. When the red vertical and horizontal cross hairs are stopped at a location along the profile, the screen shows the elevation or pressure, time of day, and date when the point was recorded.

To use the View Points option:

While on the Altimeter page, press left or right on the **ROCKER** to scroll the cross hairs across the profile.

As the cross hairs move across the profile, the status window at the bottom of the page changes to show the date, time, and altitude or pressure for the point at the intersection.

View Points on Map

You can view the location of points on the Map page.

To view altitude points on the Map page:

1. With the Altimeter page open, use the **ROCKER** to move the red crosshairs to the point you want to view.
2. Press **ENTER** to show the altitude point on the map. The point is marked by the Map Pointer with location coordinates, the compass bearing, and distance from your current location.
3. Press **BACK** to close.

To reset the elevation data and max elevation fields:

1. Press **MENU** > select **Reset** to open the Reset page.
2. Use the **ROCKER** to select the reset options, and then press **ENTER** to place a check mark in the box next to a selected item.
3. Select **Apply** to reset the data fields. A confirmation message appears.

   You can reset or delete data for any of the other features represented on the list by placing a check mark in the box next to the item.
4. Select **OK** to reset the selected options.
5. To reset all categories shown on the page, select **Select All**.

Calibrating the Altimeter

The Astro 220 relies on the barometric pressure to determine elevation. Since the pressure at any given elevation can fluctuate, you can calibrate the altimeter to increase its accuracy if you know the elevation or pressure at your current location.

To manually calibrate the altimeter:

1. Press **MENU** > select **Calibrate Altimeter** to open the Calibration page.
2. At the message "Do You Know The Correct Elevation?" select **Yes**, or if you do not know the elevation, select **No** to use the pressure option. If you do not know the pressure, select **No** to use the default GPS elevation.
3. Enter the new elevation or pressure > select **OK**.

Changing the Data Fields

The Altimeter page has two data fields that you can customize.

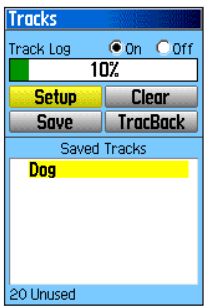
To change a data field:

1. Press **MENU** > select **Change Data Fields** > select a data field to view a list of available data field options.
2. Select an option to place it in the data field.

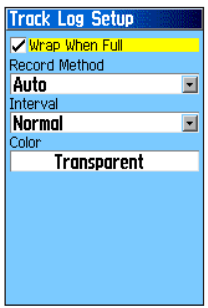
Using Tracks

The Tracks feature creates an electronic bread crumb trail or "track log" on the Map page of your travels and those of your dog(s). The track log contains information about points along its path, including time, location, and elevation for each point.

The track log starts recording as soon as the unit gets a location fix. The percentage of memory used by the current track log appears at the top of the Tracks page. After you clear the track log, it shows 0%.



Tracks Page



Track Log Setup

To clear the track log:

1. Press **MENU** twice > select **Advanced** > **GPS Applications** > select **Tracks**.
2. Select **Clear** > select **Yes** to clear the track log.

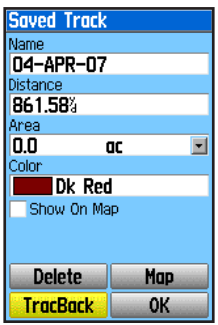
To setup a track log:

1. Press **MENU** twice > **Advanced** > **GPS Applications** > select **Tracks**.
2. Select **Setup** to open the Track Log Setup page.
   - **Wrap When Full**—sets the track log to record over the oldest data with new data when full.
   - **Record Method**—**Distance** records track points after a specified distance is traveled. **Time** creates track points after a specified time has elapsed. **Auto**, you can choose from five intervals.
   - **Interval**—records a track according to the Record Method and Interval. Enter a specific distance, time, or frequency.
   - **Color**—selects the color of the active track. If you want to change the color of a dog's track and pointer, use the color option on the Saved Track page.

To save the entire track log:

1. Press **MENU** twice > select **Advanced** > **GPS Applications** > select **Tracks**.
2. Select **Save**. A message asks if you want to save the entire track.
3. Select **Yes** to save the track. A Saving Track message shows followed by the Saved Track page.

Use the Saved Track page to rename the track, view the track distance, calculated area, and color for the track on the Map page. Changing the color of a dog's saved track also changes the pointer color on the Dog Tracker page.

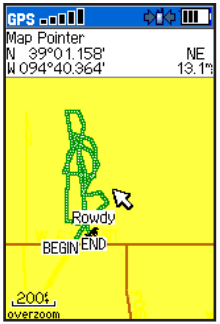


To save a portion of the track log:

1. Press **MENU** twice > select **Advanced** > **GPS Applications** > select **Tracks** to open the Tracks page.
2. Select **Save**. A message appears asking you if you want to save the entire track.
3. Select **No** to save only a portion of the track log. The entire track appears.
4. Use the **ROCKER** to move the pointer to the point on the track line that you want to be the beginning point, and press **ENTER**.
5. Use the **ROCKER** to move the arrow to the point on the track line to be the ending point, and press **ENTER**. A "Saving Track" message appears followed by the Saved Track page.
6. Select **OK**.

To view a track on the map:

On the Saved Track page, select **Map** to open the Map page. A map showing the entire track appears. Begin and End markers and user location are added to the track.



Saved track on the map

To calculate the area of a track:

1. With the Track page open and the Track Log on, press **MENU** to open the Options Menu.
2. Select **Area Calculation** to open the Area Calculation page.
3. Press **ENTER** to start the area calculation. As you begin to move and define the area's boundaries, a **Stop** button appears at the bottom of the page.
4. When finished defining the area, press **ENTER** to open the page with a **Save** button.
5. Press **ENTER** to save the new track to the Saved Tracks list on the Tracks page

Track Profiles

After you save a track, you have a record of the path you traveled and a track altitude profile.

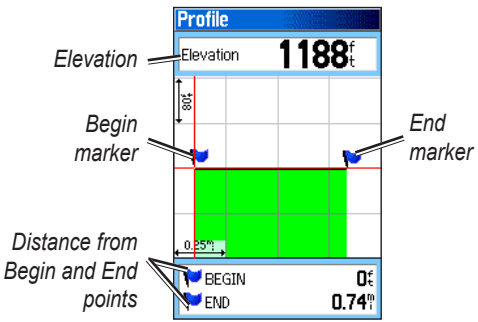
To view a track profile:

1. Open the Saved Track page, and press **MENU** > select **Profile** to view the Track Profile.

   The beginning and end of the track is marked by a flag. You can scroll across the track profile by pressing left or right on the **ROCKER**.

   As you scroll across the profile, the elevation for each point on the profile is shown at the top of the page, and the distance from the Begin point and the End point are shown at the bottom.
2. At any point along the profile, you can press **ENTER** to show that point on the map.
3. Press **MENU** > select **Zoom Ranges** and **Hide Symbols** options. To zoom ranges only, press up or down on the **ROCKER**.

You can create a Track Elevation Profile from Digital Elevation Models (DEM) maps (MapSource U.S. Topo), which include elevation data contained in the map. When these types of maps are available, a **Use Map Data - Use Track Data** option menu appears when you select **Profile**. Refer to the Garmin Web site, www.garmin.com/cartography/ontheTrail/, for more information about MapSource U.S. Topo maps.



Track Profile Page

Navigating a Saved Track

You can save your track log to use later as a TracBack. When initiated, a TracBack route takes you back to the oldest stored track log point.

To use the TracBack feature:

1. With the Saved Tracks page for the track or the Tracks page open, select **TracBack** > to open the TracBack page. A map showing the entire track appears and you are prompted to select the point you want to TracBack to.
2. Use the **ROCKER** to move the pointer to the point on the map, and press **ENTER** to start navigating the TracBack.
3. Select **Follow Road** to route back to the selected point using available roadways, or **Follow Track** to retrace your original path of travel. Select **Don't Ask Again** if you want to use the same option each time you use TracBack.

   The Map page opens with directions to the first turn on the track at the top of the page.

4. Move in the direction of the first turn. When you reach the first turn, directions to the next turn are shown, and so on, until you reach a destination.
5. To exit, press **MENU** > select **Stop Navigation**.

To create a user location on a saved track:

1. With a saved track shown on the map, use the **ROCKER** to move the pointer to the place on the track that you want to mark as a user location.
2. Press **MARK** to open the Mark Location page.
3. Customize the user location, select **OK** to save.
4. To delete these track logs, select individual logs, and then press **ENTER**. Use the **Delete All** button to clear the entire list.

Transfer of saved tracks to MapSource

See page 70 for detailed instructions. To transfer a dog's more detailed tracks from a DC 20, also see page 70.

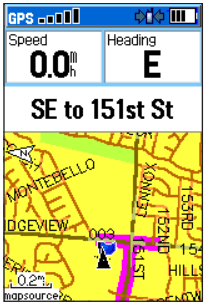
Routes

Route navigation allows you to create a path to a destination with turn-by-turn directions. The Astro 220 lets you store 50 routes with up to 250 points each.

To create a route:

1. Press **MENU** twice > **Advanced** > **GPS Applications** > select **Routes** to open the Routes page.
2. Use the **ROCKER** to select **New** to open the Routes page.
3. With the **<Select Next Point>** field selected, press **ENTER** to open the Find Menu.
4. Select a route location from one of the Find Menu categories, and open the information page for the selected location, city, exit, point of interest, and so on.
5. Select **Use** > to add it to the route.
6. To add more points to the route, repeat steps 3 to 5.
7. Select **Navigate** to begin navigating.

Route Page



Route on the Map Page

Navigating a Route

After you create a route, you can begin navigation immediately or save it to the Saved Routes list.

Routes can use existing roadways to automatically calculate a route to your destination. Turns on roadways are added to the Active Route page and are preceded by a guidance message with a graphic of the turn. If there are not enough roads at your location to calculate a route, a message appears.

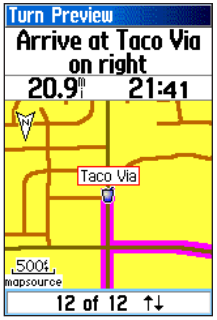
To navigate a saved route:

1. Press **MENU** twice > **Advanced** > **GPS Applications** > select **Routes** to open the Routes page.
2. Select a saved route, and press **ENTER** to open the Route page.
3. Select **Navigate**.
4. To stop navigating, press **MENU** > select **Stop Navigation**.

Using the **Follow Roads** option on the Routing Setup page increases the number of turns and shows an Active Route page with a list of turns. If you selected the **Off Road** option, you can view only the list of points for a route from the Active Route page. See Routing Setup on page 59.

To preview the turns for an active route:

1. On the Routes page, select a saved route, and press **ENTER** to open the Route page for the selected route.



Turn Preview Page

2. Select **Navigate** to begin navigation and show the route on the Map page.
3. To view the list of turns on the route, select **Active Route** from the GPS Applications Menu. To view an individual turn on the list, use the **ROCKER** to select it, and press **ENTER**.

   The Turn Preview page shows the turn and guidance text and a small field at the bottom shows the turn number in sequence and total turns in the route.

4. To scroll through all turn previews, press up or down on the **ROCKER**. Press **BACK** to close the Turn Preview page.
5. To view a route profile, press the MENU key and select **Profile** from the Options Menu (only if using MapSource US topography maps.)

To view all of the turns for an active route:

1. With an active route on the Map page, press **BACK** repeatedly to reach the **Main Menu** > **Advanced** > **GPS Applications** > **Active Route**.
2. Select any turn on the list and press **ENTER** to view the Turn Preview page for that turn.

Editing a Route

After you create a route, use the Route page to edit, change the route name, and review route points.

To change the name of the route:

1. Press **MENU** twice > **Advanced** > **GPS Applications** > select **Routes** to open the Routes page.
2. Select a saved route and press **ENTER**.
3. Select the route name field at the top of the Route page and press **ENTER**.
4. Use the **ROCKER** to operate the on-screen keypad and edit the route name.

To review individual route points:

1. Select a saved route and press **ENTER**.
2. Select a point on the route to open an options menu.
3. Select **Review** to open the information page for that route point.
4. Select **Save** (save the point as a location), **Map** (show the point on the Map page), or **Go To** (navigate to the point) >.

To delete a route:

1. Select the route to be deleted and press **ENTER**. Then select **Delete**.
2. To delete all routes, press **MENU** to open the Save Routes Options Menu. Select **Delete All Routes**.

To select the off-road transition for a route:

1. From the Advanced Menu select **GPS Applications**.
2. Select **Routes** to open the Routes page.
3. Press **MENU** to open the Options Menu.
4. Select **Off Road Transition** to open the Off Route Transition page.
5. Select **Route Leg Transition** to view the list of options.
6. Select the method to use (**Auto**, **Manual**, or **Distance**) when advancing to the next point.

Select **Distance** to enter a radius so that when you are within the entered distance, you are led to the next point on your route.

Select **Manual** to transition to the next location anytime while navigating a route.

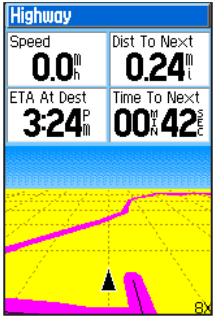
Using the Route Page Options

The Route page shows all points stored in memory for the route selected on the Routes page.

- **Remove All**—removes all locations from a saved route.
- **Reverse Route**—reverses the order of the route points in the saved route.
- **Profile**—creates a vertical profile of the route when MapSource DEM US Topo map data is used.
- **Copy Route**—makes a copy of the saved route with the same name followed by a number.
- **Delete Route**—deletes the saved route.
- **Change Data Fields**—select different values for the two data fields at the bottom of the page.
- **Restore Defaults**—restore route settings to the factory default setting.

Highway Page

When navigating a route, the Highway page guides you to the destination using data fields and a graphic highway. Up to four user-selectable data fields show information such as speed, distance, time to next point on the route, etc.



The Highway graphic provides visual guidance, taking you point by point to your final destination. Your course is represented by a center line down the middle of the graphic. As you move toward each point on your route, the graphic shows the direction you should move to stay on course to the next point. Use the **In** and **Out** keys to change the five scale settings for zooming in or out on the highway.

To navigate using the Highway page:

1. While navigating, select **Highway** from the GPS Applications Menu, and observe your path of travel displayed on the highway graphic.
2. Use the Options Menu to do the following:
   - Stop navigation/resume navigation
   - Recalculate
   - Configure data fields from four to three with a destination guidance message
   - Change the data fields
   - Restore defaults to factory settings

Proximity Locations

Use the Proximity Locations page to define an alarm circle around a stored location.

To add a proximity location:

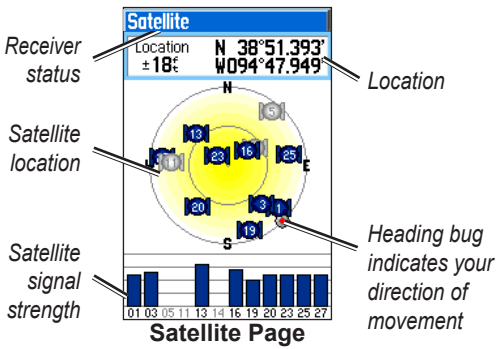
1. Access **GPS Applications** > select **Proximity** to open the Proximity Location page.
2. Select an empty line, and press **ENTER** to open the Find Menu.
3. Select a location from the Location List or from any other group of map points, and press **ENTER** to open the information page for the item.
4. Select **Use** to add the point to the list on the Proximity Location page.
5. Select **Radius** if you want to enter a value different than the default of 1 mile.

To select alarm tones and turn proximity alarms on or off:

1. Select **Proximity Alarm Tones** to open the Proximity Alarm Tones Setup page.
2. Select each alarm field and press **ENTER** to view the list of tones.
3. Select the desired tone and press **ENTER**.
4. Activate the alarms by placing a check at the bottom of the page. Speed Alerts are proximity points obtained from services provided by using POI Loader.

Satellite Page

The Satellite page shows the receiver status, satellite locations, satellite signal strength, and the receiver's current location when the unit receives signals from at least three satellites.



Satellite Page

Using the Satellite Page Options Menu

Press **MENU** to open the Options Menu.

- **Use With GPS Off/On**—enables you to turn the GPS receiver on or off.
- **Track Up/North Up**—indicates whether satellites are shown with the rings oriented with North toward the top of the display or your current heading toward the top of the display.
- **Multicolor/Single Color**—indicates whether each satellite is shown in a different color or the same color.
- **New Location**—use if you have moved the unit more than 600 miles and you are having trouble locking onto satellite signals.
- **GPS Elevation**—your GPS-determined elevation.

Accessories

To access the Accessories Menu:
Press **MENU** twice > select **Advanced** > **Accessories**.

Calendar

Use the calendar to view archived locations for activities you want to navigate to for any given day and location.

To use the Calendar:

1. Select **Calendar**. The Calendar page opens with the current week shown.
2. Use the **ROCKER** to select the day you want to add a location to, and press **ENTER** to show the page for that day.
3. Press **MENU** to open the Options Menu. Select **Add Point** to open the Find Menu.
4. Select the type of point you want to place on the Day page. (See page 24 for details on using the Find Menu.) With the information page for that point displayed, select **Use** to place the point reference on the Day page.
5. To remove points from a Day page, press **MENU** > select **Remove Points** to display the options.
6. To view other calendar formats, Sunrise/Sunset or the Hunting Almanac extended data for a specific date and location, press the **MENU** key, and use the **ROCKER** to make your choice.

Calculator

Your Astro 220 has both a standard and scientific calculator.

To use the calculator:

1. Select **Calculator**.
2. Use the **ROCKER** and the **ENTER** key to operate.

Stopwatch

Use the Astro 220 as a stopwatch, which includes a lap timer. You can also have the unit record the lap time based on distance

To access the Stopwatch:
Select **Stopwatch**.

To time a lap by distance:
Press **MENU** to open the Options Menu. Choose **Lap by Distance**. To return to the Lap by Button, repeat these same steps.

To set a lap distance value:
1. Press **MENU** to open the Options Menu. Select **Set Lap Distance**.
2. Use the **ROCKER** to select the field you want to change. Enter the new value, and press **ENTER**. When done, select **OK**.

View Sunrise/Sunset

This feature is also accessed from the Main Menu. Refer to page 16 to learn details about its operation.

View Hunting Almanac

This feature is also accessed from the Main Menu. Refer to page 16 to learn details about its operation.

Games Menu

The Games Menu contains six games (Memory Race, Virtual Maze, GekoSmak, Nibbons, Gekoids, and Beast Hunt) for entertainment. Some games use GPS as a virtual component during play. Most games contain a short tutorial.

To open the Games Menu:
Select **Games**.

Settings

Customize the operation of your Astro 220.

To access the Settings Menu:
Press **MENU** twice > select **Advanced** > **Settings**.

System Setup

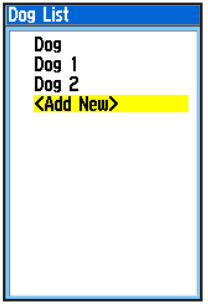
Controls settings for GPS, WAAS, battery type, language, external power, and proximity alarms.

- **GPS**—sets the unit to operate in **Normal** mode, **Battery Saver** mode, **GPS Off**, or **Demo Mode**.
- **WAAS**—enables or disables Wide Area Augmentation System.
- **Battery Type**—allows you to select the battery type (alkaline, NiMH, or lithium).
- **External Power Lost**—unit remains on (Stay On) or turns off (Turn Off) when external power is removed.
- **Proximity Alarms**—indicates if custom points of interest proximity alarms are on or off.

Use the System Options Menu to **Restore Defaults** to return the System Setup fields to their original values, **Card Info** to view micro SD card status and **Mass Storage Mode** to use a microSD card as a data storage device. **Software Version** shows the software version and unit identification number. Mass Storage and Card Info are unavailable if a microSD card is not installed.

Dog List Setup

Use the Dog List to keep track of the dogs you have linked to your Astro 220.



Dog List options allow you to view the Dog Info page, move the dog on the list, or remove the dog from the list.

Dog Alerts Setup

Use Dog Alerts to enable/disable pop-ups if your dog's status changes. Refer to page 11 for information about how to identify your dog as a specific type and eliminate unwanted alerts. To silence these alarms when they are not wanted, check the Mute box on the Tones Setup page.

- **On-Point Alert**—indicates that the dog is on-point.
- **Treed Alert**—indicates that the dog has treed quarry and has confined its movements to a small area for 60 seconds.
- **GPS Lost Alert**—the dog's DC 20 has lost GPS satellite signals.
- **Lost Communication Alert**—the Astro 220 is not receiving the DC 20 (out of range, lost power, etc.).

Display Setup

Use Display Settings to select a screen display color scheme for day and night viewing. You can set the backlight time out and the level of brightness and shorten the time out to save on battery power.

- **Display Mode**—sets the display to **Day**, **Night**, or **Auto** mode. Select **Auto** to automatically switch from day to night at sunset and change back at sunrise.
- **Daytime Color Scheme/Nighttime Color Scheme**—sets the color scheme to use when operating in Day or Night mode.
- **Backlight Timeout**—sets the backlight to stay on when turned on, or time out after period of time has elapsed when using the battery.
- **Backlight Level**—turns the backlight up or down. Press up on the **ROCKER** to increase the intensity

Tones Setup

Use the Tones Setup page to customize sound tones made by the Astro 220.

To setup Tones:

1. Select **Tone**.
2. Select the desired option and each one sounds.
3. Press **ENTER** to select a tone.

Main Menu Setup

The Main Menu can be reordered to list the menu items as you desire or remove any items you do not wish to use.

Map Page Setup

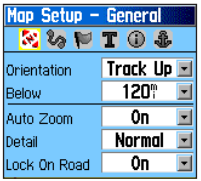
Use the Setup Map option to adjust how items are shown on the Map page.

To customize the Map page display:

1. From the Main Menu, select **Advanced** > **Settings** > **Map**.
2. Select **Map** to open the Map Setup page. The top of the page contains icons for each setup category.
3. Use the **ROCKER** to move from icon to icon when selecting a Map Setup category and to move up and down the feature fields on each page.

Map Setup – General Page

The Map Setup – General page contains the settings for Orientation, Below, Auto Zoom, Detail, and Lock On Road.

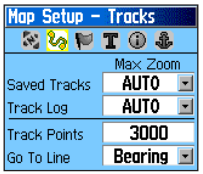


- **Orientation**—selects how the map is shown. North Up always shows north at the top of the page. Track Up shows the direction of your current heading toward the top of the page.
- **Below**—sets the map scale at which the Track Up feature appears. All scales above that revert to the North Up map orientation.
- **Auto Zoom**—zooms the map scale to include the beginning and ending points of a route.
- **Detail**—selects the degree of map detail shown.

- **Lock On Road**—locks the current position pointer to show on the nearest road, compensating for variances in map position accuracy.

Map Setup – Tracks Page

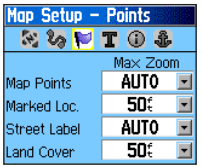
The Map Setup – Tracks page contains settings for Saved Tracks, Track Log, Track Points, and the Go To Line.



- **Saved Tracks**—sets the maximum zoom range at which saved tracks are shown.
- **Track Log**—sets the maximum zoom range at which active track logs are shown.
- **Track Points**—sets the maximum number of track points used to record a track.
- **Go To Line**—selects either a bearing or course line for navigating a track.

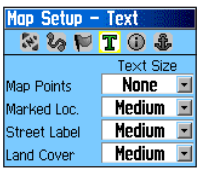
Map Setup – Points Page

Use the Map Setup – Points page to set the map scale at which **Map Points**, **Marked Location**, **Street Label**, and **Land Cover** appear on the Map page. Select **Auto**, **Off**, or a specific zoom level.



Map Setup – Text Page

Use the Map Setup – Text page to select the text size for descriptions of map items on the Map page. You can select from None, Small, Medium, or Large.



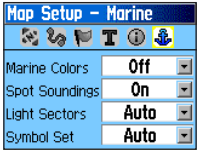
Map Setup – Information Page

The Map Setup –Information page shows a list of downloaded detailed maps such as topographic, marine charts, and MapSource maps with auto-routing capability. Use the **ROCKER** to select a map, and press **ENTER** to show it on the map display or turn it off.

Press **MENU** to view the options for displaying maps.

Map Setup – Marine Page

Use the Map Setup – Marine page to customize settings for marine colors, spot soundings, light sectors, and symbol sets when using downloaded marine charts (MapSource BlueChart marine mapping data).



- **Marine Colors**—toggles marine colors on or off on the Map page.
- **Spot Soundings**—toggles spot soundings on or off on the Map page. (Periodic depth measurements shown on the map.)
- **Light Sectors**—select Off, Auto, or ON. (navigational light locations)
- **Symbol Set**—select the symbol set to use (Auto, GARMIN, NOAA, International).

Routing Setup

Use the Routing Setup page to customize the manner in which routing functions behave.

To access the Routing Setup page:

1. From the Main Menu select **Advanced** > **Settings** > **Routing**.
   - **Guidance Method**—allows the unit to calculate routes using the preferences below:
     Prompted—prompts you to select a preference before the route is calculated.
     Follow Road—creates a route that overlays the roads shown on the map.
     Off Road—creates a direct line from your current location to your destination. This is useful when traveling outside of the detailed map coverage area or where no roads exist.
   - **Follow Road Method**—sets how the unit calculates follow road routes based on one of the following preferences:
     Prompted—you are prompts you to select a preference before the route is calculated.
     Faster Time—calculates routes that are faster to drive but might be longer in distance.
     Shorter Distance—calculates routes that are shorter in distance but take more time to drive.
   - **Next Turn Pop-up**—turns the Next Turn pop-up window on or off.
2. Select **Follow Road Options** to open the Follow Road Options page where you can select additional route options.
   - **Off Route Recalculation**—allows you to set whether the unit prompts you when it is recalculating your route (Prompted) or recalculates automatically or Off.

- **Calculation Method**—sets how the unit searches for the route using the criteria below.
  Quickest Calculation—calculates the route the quickest, but it might not produce the best route.
  Quick Calculation—takes more time to calculate but generates a better quality route.
  Better Route—generates an even better quality route but uses a longer calculation time.
  Best Route—generates the optimal route but takes the longest time to calculate.
- **Calculate Routes For**—sets route calculation for the vehicle you are operating to optimize the route for your vehicle type, because some roads have vehicle-based restrictions.
- **Avoid**—allows you to avoid certain road types and maneuvers on your route.

Geocache Setup

Use the Geocache Setup page to find and record items hidden at geographic locations. Go my.garmin.com, login and click Go Geocaching for details and how to download geocache locations from the Internet.

NOTE: Before setting up and placing physical geocache stations on public or private land, be certain you are not in violation of ordinances or laws governing use of these properties.

To access the Geocache Setup page:

1. From the Main Menu, select **Advanced** > **Settings** > **Geocache**.
2. Select the **Calendar Entry When Found** field > and choose **Yes** or **No**. Read instructions contained on this page to learn more about geocaching.

Marine Alarms Setup

To access the Marine Setup page:

From the Main Menu select **Advanced** > **Settings** > **Marine Alarms**.

- **Anchor Drag Alarm**—sets an alarm when you exceed a specified drift distance.
- **Off Course Alarm**—sets an alarm to sound when you are off your chosen course.

Time Setup

To access the Time Setup page:

From the Main Menu, select **Advanced** > **Settings** > **Time**.

- **Time Format**—sets 12 or 24 hour format.
- **Time Zone**—sets the time zone for your city to show the correct local time. Select **Other** to enter a Universal Time Coordinate offset.

Units Setup

To access the Units Setup page:

From the Main Menu select **Advanced** > **Settings** > **Units**.

- **Position Format**—sets the coordinate system in which a particular location is shown. The default format is latitude and longitude in degrees, minutes, and thousandths of a minute (hdddomm.mmm).
- **Map Datum**—sets the description for geographic location for surveying, mapping, and navigation and is not an actual map built into the unit. The default setting is WGS 84. The unit automatically chooses the best datum based on your chosen format.
- **Distance/Speed**—sets the unit of measurement to show your speed and distance traveled.
- **Elevation (Vert. Speed)**—sets the unit of measurement (Feet [ft/min], Meters [m/min], or Meters [m/sec]) to show your rate of ascent.

- **Depth**—select the unit of measurement (Feet, Fathoms, or Meters).
- **Pressure**—sets the unit of measurement (Inches, Millibars, or Hectopascals) to show pressure.

Heading Setup

Use the Heading Setup page to specify the type of heading display and the type of North reference used to calculate your heading.

NOTE: Unless you have a working knowledge of headings and North referencing, it is recommended that you use the default values.

To access the Heading Setup page:

From the Main Menu select **Advanced** > **Settings** > **Heading**.

- **Display**—sets the value (Cardinal Letters, Degrees, or Mils).
- **North Reference**—provides headings based on a true, magnetic, grid, or specific user value.
- **Switch to compass heading when below** (for more than...)—allows you to enter a speed and time delay for electronic compass switching.

Calibration Setup

The Calibration Setup page allows you to calibrate the compass and altimeter for increased accuracy in navigation.

To calibrate the compass:

1. From the Main Menu, select **Advanced** > **Settings** > **Calibration**. The “Which sensor would you like to calibrate?” message appears.
2. Select **Compass** to open the Compass Calibration page. Follow the instructions provided by the compass setup wizard.

To calibrate the Altimeter:

Select **Altimeter** to display the Altimeter Calibration page. Follow the instructions provided by the altimeter setup wizard.

Altimeter Setup

The Altimeter Setup page allows you to setup the altimeter to self-calibrate each time you turn on the unit, to function as a barometer, or to manually calibrate when you have accurate elevation or pressure data.

To set up the altimeter:

1. On the Settings Menu, select **Altimeter**.
2. Select the Auto Calibration field > **ENTER** to select from On or Off. When On, elevation is corrected by the GPS receiver.
3. Select the **Barometer Mode** field > to select **Variable Elevation** (used when moving) or **Fixed Elevation** (used when stationary, allowing the altimeter to function as a standard barometer). Trip data is not recorded when in Fixed Elevation mode.

To manually calibrate the altimeter:

1. Select the **Calibrate Altimeter** button >. Calibrate the altimeter using one of three methods:
   - Enter the correct elevation: this requires a reliable source for determining the elevation for your current location.
   - Enter the correct pressure: this requires a reliable source to determine the accurate barometric pressure at your current location.
   - Allow the GPS Receiver to determine the elevation.
2. When finished, a “Completed” or “Failed“ message appears.

Appendix

Specifications

Physical

Size: Astro 220 - 6.25" H x 2.25" W x 1.25" D
DC 20 - 1.75" H x 3.25" W x 1.5" D

Weight: Astro 220 - 6.5 ounces (185 g) w/o batteries installed.
DC 20 - 6.0 ounces (170g) w/battery pack- w/o collar attachment plate

Display: Astro 220 - 1.5" W x 2.2" H, 256-color, high resolution, transreflective (160 x 240 pixels) with backlighting.

Case: Rugged, fully gasketed, water resistant, IEC-529, IPX7

Temp Range: Astro 220 -4 to 158°F (-20 to 70°C)*
DC 20 -4 to 140°F (-20 to 60°C)
DC 20 charging temp. 32 to 113°F (0 to 45°C)

*The temperature rating of the Astro System may exceed the usable range of some batteries. Some batteries can rupture at high temperatures.

GPS Performance

Receiver: WAAS enabled

Acquisition Times*:

Approximately 1 second (warm start)
Approximately 38 seconds (cold start)
Approximately 45 seconds (factory reset)

*On average for a stationary receiver with an open sky view.

Update Rate: 1/second, continuous

Antenna: Astro 220 -Built-in quad helix
DC 20 - Built-in Patch

Accuracy

GPS: <10 meters (33 feet) 95%

DGPS: 3-5 meters (10-16 feet) 95% typical*

*WAAS accuracy in North America.

Velocity: 0.05 meter/sec steady state

Miscellaneous

Compass: Accuracy; +/- 2 degrees*, resolution; 1 degree
Altimeter: Accuracy; +/- 10 feet*, resolution; 1 ft.
Range -2,000 to 30,000 feet

*Subject to proper user calibration.

Interfaces: USB for computer interface
Data Storage Life: Indefinite; no memory battery required
Map Storage: Depends on microSD card capacity*

*A small portion of the card capacity has been used in formatting the card for use.

Power

Source: Astro 220 -Two 1.5 volt AA batteries, USB Data Cable, Vehicle Power Adapter

DC 20 - Internal rechargeable lithium-ion battery, Vehicle Power Adapter, AC charger

Battery Life: Astro 220 - Up to 24 hours (typical use)*
DC 20 - Up to 17 hours Recharge 3 to 4 hours

*Alkaline batteries lose a significant amount of their capacity as the temperature decreases. Use Lithium batteries when operating in below-freezing conditions.

Radio

MURS Frequency: 151.82 MHz
151.88 MHz
151.94 MHz
154.57 MHz
154.60 MHz

Range: Up to five miles (line of sight)
Output POWER: DC 20 - 2 Watts

Optional Accessories

To obtain replacements for accessories provided with the unit and for optional accessories, contact your Garmin Dealer, or Garmin Product Support in the USA at 800/800.1020.

Auto Navigation Kit—provides the accessories and map data for using the Astro 220 in an automobile.

Vehicle POWER Adapter—powers the Astro 220 from an automobile cigarette lighter.

MapSource Software Data Disks and Pre-Loaded microSD Cards—offer detailed mapping that is compatible with the Astro 220. Visit the Garmin Web site at www.garmin.com/products/astro/.

Marine Mount Kit—Astro 220 installation on a boat.

Automotive Mount Kit—Astro 220 installation on an automobile dash. (Does not include mapping data.)

Automotive Windshield Suction Mount Kit—allows installation on an automobile windshield.

Battery Pack—rechargeable, NiMH battery. (Astro 220)

Retractable Tether—provides a convenient method for retaining the Astro 220.

Short Antenna for use with the DC 20—for use in dense cover to reduce snagging of brush.

Magnetic Mount Antenna—allows the Astro 220 to track dogs while in a vehicle.

Replacement Lithium-Ion Battery for DC 20—replaces a DC 20 battery that no longer holds a charge.

Replacement VHF Antenna—(2 pack)

Replacement Carrying Case

Replacement Dog Harness

Connecting your Astro 220 to a Computer

Before connecting your Astro 220 to your computer you must install the USB drivers contained in the MapSource Trip & Waypoint Manager software.

NOTE: Install the supplied MapSource Trip & Waypoint Manager software on your computer before connecting the USB cable to the computer. Follow the instructions for installation and operation provided with the software.

Information about USB Drivers

The USB drivers are automatically installed when you install the MapSource Trip and Waypoint Manager software that came with your Astro 220. When you initially connect the Astro 220 to a USB port, your computer might prompt you to locate the destination of the drivers for the device. You only need to install the drivers once. After the drivers are installed, your computer always detects your Astro 220 when it is connected. USB drivers might be updated periodically. You can update at: www.garmin.com.

To connect your Astro 220 to your computer:

1. Lift the USB protective cover from the back of the Astro 220, and insert the smaller connector on the USB cable into the matching port.
2. Connect the remaining cable end to your computer's USB port.

Transferring Data to a microSD Card

Many of the Astro 220 navigation features require detailed mapping data in order to be fully operational, so you may want to purchase and transfer maps before using the unit. A microSD card (provided by the user) can be loaded with detailed maps from optional MapSource disks for your computer to enhance the versatility of your Astro System. With selected MapSource detailed mapping data, you can view listings of nearby restaurants, lodging, shopping centers, attractions and entertainment, and even retrieve addresses and phone numbers for any listed location. To achieve the best terrain details, when hunting, use Garmin U.S. Topographic maps. The amount of data transferable is limited to the capacity printed on the microSD card.

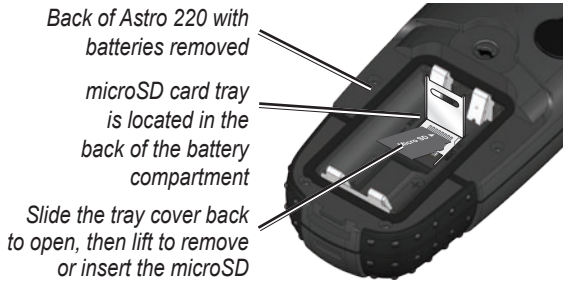
Map data transfer requires installation of Trip and Waypoint Manager and the USB Interface Cable to transfer MapSource data from a computer to the microSD card in the Astro 220. To transfer other data to the microSD card, use the USB Mass Storage feature explained on page 68.

You can purchase high capacity microSD cards at your electronics supplier or pre-loaded MapSource detailed map data cards from your Garmin dealer. See the Garmin Web site: www.garmin.com/cartography/ for compatible MapSource products.

Use Garmin MapSource for transfer of both your own and your dog's tracks from the Astro 220 to MapSource. Highly detailed dog tracks can be transferred from the DC 20 via the Astro using the "Transfer Dog Unit Track" option from the Dog Info page Option Menu.

To install or remove the microSD card:

1. Remove the Battery Compartment Cover from the back of the unit and remove the batteries.
2. Locate the card tray in the battery compartment.


Back of Astro 220 with batteries removed
microSD card tray is located in the back of the battery compartment
Slide the tray cover back to open, then lift to remove or insert the microSD card. Slide the cover forward to lock in place

Detail of microSD card tray

To transfer Garmin MapSource map data to the microSD card:

Follow the instructions for selecting and downloading maps provided with the MapSource map data disk.

To use the USB Mass Storage Mode:

1. Connect the Astro to a computer using the USB cable provided.
2. Press **MENU** twice > select **Advanced** > select **Settings** > select **System** > **MENU**.
3. Select **Mass Storage Mode**.
4. Observe an Unplug or Eject icon shown on a PC's system tray or a storage device icon for the microSD on a Macintosh®.
5. Double-click on a computer's **My Computer** to observe a new Removable Disk Drive listed. If drives are networked, see the note below.

   If using a Macintosh, double-click on the icon to view the directory of files.

To view information for the microSD card:

Prior to downloading data to the microSD card, press **MENU** > **View Card Info** to view data card storage information

To transfer files to the microSD card:

1. Double-click the **My Computer** desktop icon.
2. Browse the PC or Macintosh for the file to copy.
3. For a PC, select the file and select **Edit** > **Copy** and open the drive identified with the Astro 220.

NOTE: If you have several network drives mapped to your computer, Windows® may experience difficulty assigning a drive letter for your unit microSD card. Either log on without connecting to the network or click **Start** > **Settings** > **Control Panel** > **Administrative Tools** > **Computer Management** > **Storage** > **Disk Management** and remap a drive letter for the Astro 220 removable storage device.

4. Select **Edit** > **Paste**. The file appears in the list of files on the Astro 220 microSD card.
5. For a Macintosh, click and drag the desired file into the microSD card directory.
6. After data transfer, double-click on the **Unplug** or **Eject** icon in your PC system tray and select **Stop** or unmount the connection if using a Macintosh.
7. Pressing and releasing the unit **POWER** button exits the USB Mass Storage page at any time, but can corrupt files if done while transferring data.

Upgrading DC 20 and Astro 220 software from the Garmin Web site

During the life of your Astro Dog Tracking System, Garmin may offer periodic upgrades to the operating software downloaded from the Garmin Web site.

Upgrading Astro 220 software

To upgrade software on the Astro 220:

1. Be certain you have installed Garmin MapSource Trip and Waypoint Manager as explained on page 69.
2. Turn on the Astro 220 and connect it to your computer's USB port using the cable provided with the unit.
3. Go to the http://garmin.com/products/Astro. Click on Updates & Downloads.
4. Follow instructions for using WebUpdater or click download from Unit Software from the Web site and follow instructions.

NOTE: Do not turn off the Astro 220 or DC 20 during data transfer to avoid data corruption.

Upgrading DC 20 software

The DC 20 uses your Astro 220 as a wireless transfer device when transferring software updates and detailed dog tracks.

1. Be certain you have installed Garmin MapSource Trip and Waypoint Manager as explained on page 69.
2. Turn on the Astro 220 and connect it to your computer's USB port using the cable provided with the unit.
3. Turn on the DC 20, place it within 12 inches of the Astro 220.
4. Go to the Garmin Web site and open the product page for the Astro System. Then select Updates & Downloads.
5. Open the Astro 220 Dog Info page for the DC 20 you are updating and press MENU > Upgrade Dog Unit and follow on-screen instructions.
6. Follow instructions for using WebUpdater or click download from Unit Software and follow instructions.

Transferring tracks from the Astro 220 to MapSource on your computer

Tracks saved on your Astro 220 (both your own and your dog's) can be saved and viewed in Garmin MapSource.

To transfer tracks:

1. Be certain Garmin MapSource Trip and Waypoint Manager is installed on your computer and open.
2. Select the Tracks tab on the left side of the MapSource screen.
3. Click "Receive from Device" from the Transfer menu or click the "Receive from Device" icon at the top of the screen.

Transferring more detailed dog tracks from a DC 20 to MapSource

The dog tracks saved on your Astro 220 are detailed enough for most users to view the movements of their dog. However the DC 20 stores much more detailed tracks of the dog's movements. These tracks can be transferred to MapSource on your computer using the Astro 220 as a wireless transfer device to a computer.

To transfer dog unit (DC 20) tracks:

1. Be certain Garmin MapSource Trip and Waypoint Manager is installed on your computer and open.
2. Turn on the Astro 220 and connect it to your computer's USB port using the cable provided with the unit.
3. Turn on the DC 20 and place it within 12 inches of the Astro 220.
4. Open the Astro 220 Dog Info page for the DC 20 you are downloading tracks from and press **MENU** > **Transfer Dog Unit Track**. Wait until the track data is buffered in to your Astro 220 and a "Ready to communicate with PC" message appears. Do not press **OK** until Step 6 is completed.
5. Go to MapSource and click the Tracks tab on the left side of the screen. Click "Receive from Device" from the Transfer menu or click the "Receive from Device" icon at the top of the screen. When the "Receiving from..." window opens, be certain to uncheck the "Turn off Unit when transfer is complete" option.
6. Press the **ENTER** key on the Astro when done.

Caring for the Astro System

Cleaning the Case

Clean each unit's outer casing (except for the Astro screen) using a cloth dampened with a mild detergent solution and then wipe dry. Avoid cleaners that may damage plastic.

Cleaning the Astro 220 Screen

Clean the Astro 220 screen using a soft, clean, lint-free cloth. Use water, isopropyl alcohol, or eyeglass cleaner. Apply the liquid to the cloth, and then gently wipe the screen with the moistened cloth.

Cleaning the Dog Harness

Hand wash the harness using a mild detergent solution, rinse, and then air dry. Avoid chemical cleaners that may damage the material. Do not dry in a clothes dryer.

Storage

Do not store where prolonged exposure to temperature extremes may occur, as permanent damage may result.

Long-Term DC 20 Battery Storage: The normal long-term decrease in the charging capacity of lithium-ion batteries can be accelerated by exposure to elevated temperatures. Storing a fully charged battery for more than three months in a location that exposes it to high temperatures (above 70° F) can significantly reduce its recharging capacity. Before storage, charge the battery to approximately 50% of capacity and store in a cool dry location where temperatures are not expected to exceed typical household levels. Do not store a fully depleted battery as it may not recharge after an extended period of storage. Fully charge the battery again after storage before using the DC 20.

Water Immersion

The Astro 220 and DC 20 are waterproof to IEC Standard 60529 IPX7. They can withstand immersion in 1 meter of water for 30 minutes. Prolonged submersion can cause damage to the units. After immersion, be certain to wipe and air dry the units before reuse or charging.

Software License Agreement

BY USING THE ASTRO SYSTEM, YOU AGREE TO BE BOUND BY THE TERMS AND CONDITIONS OF THE FOLLOWING SOFTWARE LICENSE AGREEMENT. PLEASE READ THIS AGREEMENT CAREFULLY.

Garmin grants you a limited license to use the software embedded in this device (the "Software") in binary executable form in the normal operation of the product. Title, ownership rights, and intellectual property rights in and to the Software remain in Garmin.

You acknowledge that the Software is the property of Garmin and is protected under the United States of America copyright laws and international copyright treaties. You further acknowledge that the structure, organization, and code of the Software are valuable trade secrets of Garmin and that the Software in source code form remains a valuable trade secret of Garmin. You agree not to decompile, disassemble, modify, reverse assemble, reverse engineer, or reduce to human readable form the Software or any part thereof or create any derivative works based on the Software. You agree not to export or re-export the Software to any country in violation of the export control laws of the United States of America.

Product Registration

Help us to better support you by completing online registration today! Connect to our Web site at: http://my.garmin.com.

Use this area to record the serial number (8-digit number located on the back of the Astro 220 and bottom of the DC 20) in case your system needs service. Keep the original sales receipt, or a photocopy, in a safe place.

Astro Number: ___ ___ ___ ___ ___ ___ ___ __

DC 20 Number: ___ ___ ___ ___ ___ ___ ___ __

DC 20 Number: ___ ___ ___ ___ ___ ___ ___ __

DC 20 Number: ___ ___ ___ ___ ___ ___ ___ __

DC 20 Number: ___ ___ ___ ___ ___ ___ ___ __

DC 20 Number: ___ ___ ___ ___ ___ ___ ___ __

Tell Us What You Think

Tell us how you like this manual! Fill out the Product Documentation Survey. Go to: www.garmin.com/contactUs/, and click **Product Documentation Survey**.

FCC Compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and may cause harmful interference to radio communications if not installed and used in accordance with the instructions. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet that is on a different circuit from the GPS unit.
- Consult the dealer or an experienced radio/TV technician for help.

This product does not contain any user-serviceable parts. Repairs should only be made by an authorized Garmin service center. Unauthorized repairs or modifications could result in permanent damage to the equipment, and void your warranty and your authority to operate this device under Part 15 regulations.

IMPORTANT: READ THIS INFORMATION BEFORE USING YOUR ASTRO DOG TRACKING SYSTEM:

Exposure to Radio Frequency Signals—Your product is a low power radio transmitter and receiver. When it is on, it receives and also sends out radio frequency (RF) signals. In August 1996, The Federal Communications Commissions (FCC) adopted RF exposure guidelines with safety levels for handheld wireless radios. Those guidelines are consistent with safety standards previously set by both U.S. and international standards bodies: American National Standards Institute (ANSI) IEEE. C95.1-1992; National Council on Radiation Protection and Measurements (NCRP) Report 86; International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1996. Those standards were based on comprehensive and periodic evaluations of the relevant scientific literature. For example, over 130 scientists, engineers, and physicians from universities, government health agencies, and industry reviewed the available body of research to develop the ANSI Standard (C95.1). The design of your radio complies with the FCC guidelines (and those standards).

For body-worn and face-held operation, this radio demonstrates compliance and meets the FCC RF exposure guidelines for

uncontrolled exposure (general population) when used with approved accessories supplied with or designed for this product. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

Antenna Care—Use only the supplied antenna. Unauthorized antennas, modifications, or attachments could damage the radio and may violate FCC regulations. **Do Not use any radio that has a damaged antenna, because if it comes into contact with your skin, a minor burn can result.**

Electronic Devices—Most modern electronic equipment is shielded from RF signals. However, certain equipment may not be shielded against the RF signals from your wireless radio.

Pacemakers—The Health Industry Manufacturers Association (HIMA) recommends that a minimum separation of six inches (6") be maintained between a handheld wireless radio and a pacemaker to avoid potential interference with the pacemaker. These recommendations are consistent with the independent research by and recommendations of Wireless Technology Research. Persons with pacemakers should ALWAYS keep the radio more than six inches from their pacemaker when the radio is turned on, should not carry the radio in a breast pocket, should use the ear opposite the pacemaker to minimize the potential for interference, and should turn the radio off immediately if you have any reason to suspect that interference is taking place.

Hearing Aids—Some digital wireless radios may interfere with some hearing aids. In the event of such interference, you may want to consult your hearing aid manufacturer to discuss alternatives.

Other Medical Devices—If you use any other personal medical device, consult the manufacturer of your device to determine if it is adequately shielded from external RF energy. Your physician may be able to assist you in obtaining this information.

Turn your radio OFF in health care facilities when any regulations posted in these areas instruct you to do so. Hospitals or health care facilities may be using equipment that could be sensitive to external RF energy.

Vehicles—RF signals may affect improperly installed or inadequately shielded electronic systems in motor vehicles. Check with the manufacturer or its representative regarding your vehicle. You should also consult the manufacturer of any equipment that has been added to your vehicle.

Posted Facilities—Turn your radio OFF in any facility where posted notices so require.

Commercial Aircraft—Many commercial airlines prohibit the use of FRS/GMRS radios on board. Switch OFF your radio before boarding an aircraft or check the airline rules.

Blasting Areas—To avoid interfering with blasting operations, turn your radio OFF when in a "blasting area" or in areas posted: "Turn off two-way radio." Obey all signs and instructions.

Potentially Explosive Atmospheres—Turn your radio OFF and do not remove your battery when you are in any area with a potentially explosive atmosphere. Obey all signs and instructions. Sparks from your battery in such areas could cause an explosion or fire resulting in bodily injury or even death.

Areas with a potentially explosive atmosphere are often, but not always clearly marked. They include fueling areas such as gasoline stations, below deck on boats, fuel or chemical transfer or storage facilities; vehicles using liquefied petroleum gas (such as propane or butane); areas where the air contains chemicals or particles, such as grain, dust, or metal powders; and any other area where you would normally be advised to turn off your vehicle engine.

Limited Warranty

This Garmin product is warranted to be free from defects in materials or workmanship for one year from the date of purchase. Within this period, Garmin will, at its sole option, repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts or labor, provided that the customer shall be responsible for any transportation cost. This warranty does not cover failures due to abuse, misuse, accident, or unauthorized alteration or repairs.

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sole discretion. SUCH REMEDY SHALL BE YOUR SOLE AND EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.

To obtain warranty service, contact your local Garmin authorized dealer or call Garmin Product Support for shipping instructions and an RMA tracking number. Securely pack the unit and a copy of the original sales receipt, which is required as the proof of purchase for warranty repairs. Write the tracking number clearly on the outside of the package. Send the unit, freight charges prepaid, to any Garmin warranty service station.

Online Auction Purchases: Products sold through online auctions are not eligible for rebates or other special offers from Garmin. Online auction confirmations are not accepted for warranty verification. To obtain warranty service, an original or copy of the sales receipt from the original retailer is required. Garmin will not replace missing components from any package purchased through an online auction.

International Purchases: A separate warranty is provided by international distributors for units purchased outside the United States. This warranty is provided by the local in-country distributor and this distributor provides local service for your unit. Distributor warranties are only valid in the area of intended distribution. Units purchased in the United States or Canada must be returned to the Garmin service center in the United Kingdom, the United States, Canada, or Taiwan for service.

INDEX

A

accessories 65
adding dogs to the Dog List 13
addresses 28
altimeter page
  calibration 39
  data fields 39
  options menu 36
  pressure/elevation plots 37
  view points 38
  zoom ranges 37

B

backlight 4
battery installation 2
battery warnings v
bearing pointer 34

C

calibrating the compass 6
changing a dog track color 40
changing data fields 39
charging the DC 20 5
cleaning 71
communicating with the DC 20 9
compass page
  calibrating the compass 6
  options menu 32
conflicting dog signals 14
Course Deviation Indicator 34
course pointer 34

D

data card storage information 68
display setup 55
dog alerts 55
dog info page 10
dog tracking 9

E

elevation, GPS 51
ENTER key 3

F

finding
  an address 28
  an interstate exit 28
  a city 28
  a geocache 27
  a point of interest 29

G

geocache setup 60
go to marked location 16
guidance text 21

H

highway page 49
how to
  adjust zoom ranges 38
  create a route 45
  manually calibrate the altimeter 39
  program a data field 39
  project a location 19
  use Sight N Go to navigate 32
  use the View Points option 38

I

IN/OUT Zoom keys 3
initializing the GPS receivers 5
installing the belt clip 2
installing the lanyard 2

L

locations
  averaging a location 19
  marking 17
  moving 19
  projecting 19

M

manual conventions 7
map page
  map data fields 22
  measuring distance 23
  options menu 21
  review map information 20
MapSource 66
marine setup 60
marking a location using the map page 18
marking hunting specific locations 18

marking current location 17
MARK key 3
MENU key 3

N

naming the dog 10
north up/track up 51

P

pause all tracking 12
POWER key 3, 4, 5
pressure plots, view 37
projecting a location 19
proximity alarm tones 50
proximity locations 49

Q

QUIT key 3

R

ROCKER key 3
routes 45
  copying 48
  creating 45
  deleting 47
  navigating 45
  route page options 48
  turn previews 46, 47
routing setup 59

S

satellite page 50
selecting options 7
Sight 'N Go 32
start new hunt 15
status bar 8
stop (resume) navigation 21
stop tracking 11
system setup 54

T

time setup 61
tip and shortcuts i
tracking a dog 11
tracks 40
  calculating a track's area 42
  clearing 40
  profiles 42
  saving 41
  setup 40
  viewing 41
track up/north up 51
transferring data to a microSD
  card 67
transferring tracks 70
Trip and Waypoint
  Manager 66

U

units setup 61
upgrading software 69
using the keypad 3

V

view hunting almanac 16
view sunrise/sunset 16

W

warnings iv

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